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1920—Thirty Years of Service to Construction—1950

Contractors and Engineers Monthly

Vol. 47, No. 11 NOVEMBER, 1950

Covering the Field

NOV 8 1950

• Equipment Deliveries

Have you ordered what you'll need for next year? If not, take warning from the article on page 3.

• Store and Auditorium

The store, page 5, required some 30,000 yards of granite excavation.

The auditorium, page 29, resembles a huge plane hangar with its Z-D arch roof.

• County Road Work

A county engineer, at it for nearly 40 years, tells on page 10 how he keeps his system an all-weather one.

• Dams

On page 14, a mast-mounted drill prepares anchor holes at Fort Randall Dam.

On page 71, turbine-installation methods at two dam projects are revised.

• Blacktop, Illinois Style

Widening was included too in the improvement contract reported on page 18.

• Ore Pier

The B. & O. is building it at Baltimore. Concrete piles support the concrete walls connected by tie rods. Steel sheet piles retain the slag fill. See page 22.

• Airport Capacity Upped

A novel drain system, a million dollars worth of grading, and concrete paving were part of the job. Page 34.

• Nueces Bay Causeway

A rig that rolled over bents drove the piles; steel was welded; small form panels speeded deck pours. See pages 40–41.

• Tunnel at Norfolk

The tenth trench-type tunnel in the U. S. is under way at Norfolk, Va. Page 48 stresses trench dredging.

• Grading Through Swamp

Blasting liquefied the area and sand fill forced muck out, as new location went in for U. S. 6 in Alabama. Page 54.

• Speedy Seeding, Sodding

Small machines and good organization were responsible for this pace-setting job in Iowa. Page 57 carries the story.

• Harbor for Cotton City

Material dredged from the harbor channel was used to build up an industrial site, as page 60 explains.

• Expressway Concreting

Los Angeles is getting its freeway. N. M. Ball Sons was in high gear when we photographed his job—page 66.

• Bridge for Pipeline

When natural gas from Texas reaches New York City, it will be thanks in part to the pipeline suspension bridge whose construction is described on page 75.

• Canal Rolls On

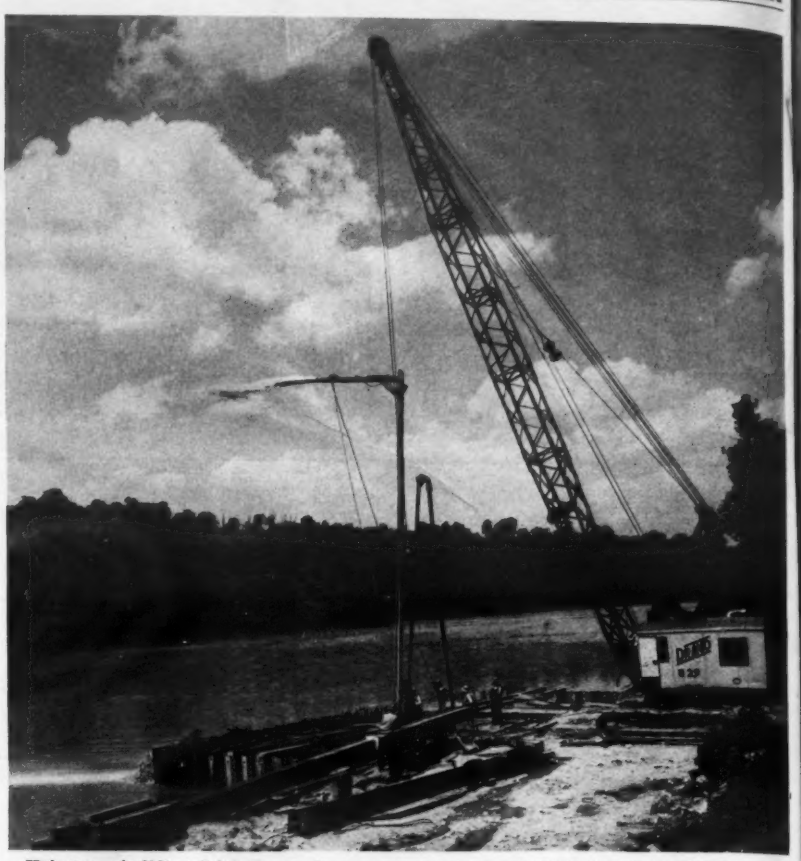
In spite of unforeseen rock, crews push 20,000 linear feet of concrete-lined canal to completion. Page 84.

(You will find "In This Issue" on page 4)

C. & E. M. Photo

A custom-made mast-mounted drill sinks anchor holes high on the chalk walls of the stilling basin at Fort Randall Dam. McKinney Drilling Co.'s Superintendent Harry Bell looks on. Page 14 describes this drilling subcontract.

Manhattan's "Great White Way" is invaded by Allis-Chalmers graders and dozers. They belong to Frank Mascali & Sons, Flushing, Long Island, who is stripping old pavement and car tracks and resurfacing Broadway from 42nd St. to Columbus Circle.



Using an air lift and jet, Dravo Corp. workmen clean out drilled-in steel caissons sunk for one of the six piers of a new 1,540-foot bridge over Beaver River northwest of Pittsburgh. The bridge will carry the western extension of the Pennsylvania Turnpike.

NEWS AND VIEWS

of the construction industry at home and abroad

Just some notes from here and there before we turn this month's page over to job photos.

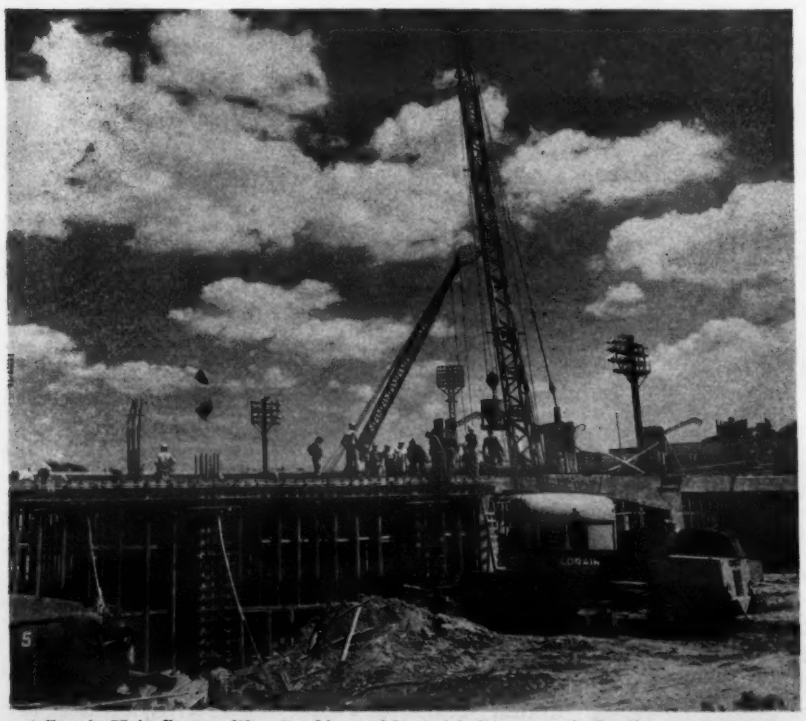
Heavy construction during the first nine months of 1950 smashed all previous 12-month records to total almost $9 billion. Biggest gains were in private construction. Only public housing, earthwork, irrigation, drainage, and waterways were lagging.

The housing boom no longer booms, what with the mortgage credit controls of July 19. FHA applications for individual homes dropped almost 50 per cent between the end of July and the middle of September. "Life has been good to you for some time," Dr. Edwin G. Nourse, former Chairman of the President's Council of Economic Advisors, told the Producer's Council recently. But the housing industry seems certain to be a major casualty of the defense production program and its economic controls.

Shortages? Of cement? Yes, indeed. Strikes are blamed—strikes in the cement industry itself, and in coal and railroads. So is seasonal demand. But new plants are being built, existing ones enlarged. There should be more cement in 1951 . . . Douglas-fir **plywood?** Yes again. But because of unprecedented civilian demand, not military, which will take only 15 per cent of this year's production . . . The **steel** industry has told Secretary of Commerce Sawyer that it will expand its annual capacity by almost 9.5 million net tons between now and the end of 1952. It will increase its blast-furnace capacity during the same period by 1.7 million net tons. Defense, say present estimates, will take about 4 million tons a year—only 4 per cent of current annual capacity.

Steel and rubber shortages are taking their toll, of course, in **slower equipment deliveries.** But of that, more on the facing page.

This year saw reconstruction of the world's longest street, Broadway, in Manhattan (see top of page), and on what is generally recognized as the world's widest avenue—Julio in Buenos Aires, Argentina. The avenue measures approximately 430 feet in width. This Huber 3 to 4-ton tandem roller is owned by Direccion Autarquica de Obras Municipales.



A Lorain Moto-Crane with a 3-cubic-yard bucket hoists concrete for the new Baltimore Memorial Stadium. DeLuca-Davis and Fred Carozza Construction Cos. of Baltimore teamed up for the contract. The stadium will have a seating capacity of about 50,000.

West and north of Sao Paulo, in Brazil, a railroad right-of-way is constructed for the Estrada de Ferro Sorocabana. A Caterpillar DW10 tractor and a Caterpillar No. 10 scraper are pushed-loaded by a D8 and a D7.

Need New Equipment For '51? Order Now!

Deliveries Are at Least One Or Two Months Slower This Year Than Last, a Survey of Manufacturers Shows

+ HAVE you placed your orders yet for the new equipment you will need next year? If not, now is the time to get busy on them, for the sales and delivery picture has changed noticeably since a year ago.

So say the replies to a questionnaire CONTRACTORS AND ENGINEERS MONTHLY sent out recently to leading equipment manufacturers, asking: What delivery date are you quoting now? . . . How does it compare with the date you were quoting this time a year ago? . . . What has happened to your production since the outbreak of war in Korea? . . . Do you expect your production to increase, decrease, or stay the same during the first half of 1951?

Delivery in 1950 Vs. 1949

Delivery is slower now than this time last year, according to 75 per cent of the 140 replies—4 to 8 weeks slower, and sometimes 12, 16, 20, and even 24 weeks slower. For orders placed at the beginning of this fall, the manufacturers surveyed were quoting anything from immediate to 12-month deliveries. (This time a year ago, quotations from the same group of manufacturers ranged from immediate to only 6 months.) This year only 12 per cent could quote immediate delivery, as opposed to twice that percentage last year. This year only 22 per cent could deliver in from 1 to 4 weeks, as opposed to almost twice that percentage able to do so last year.

In other words, purchasers last year could pretty generally expect immediate or 1 to 4-week delivery. This year they will be lucky to get 8 to 12-week delivery.

It may be significant that over half of the manufacturers quoted their deliveries in terms of a range of, for example, 6 to 8 weeks; they apparently felt the need of some leeway in any commitment. Usually the inside and outside numbers of the range covered about 4 weeks. But many quotations ranged over 8 to 12 weeks, and one over six months. Several of those replying explained the range this way: "depending on the tool (item, model, size) ordered" or "depending on the ability to secure steel".

The following table lists deliveries generally in terms of 4-week intervals, and indicates what percentage of the replies fell within each 4-week period in 1949 as compared to 1950. (Where replies quoted deliveries in terms of an inside and outside limit, it seemed wise to be pessimistic and take the outside limit or longer delivery date.) It is significant that in 1949 only 2.4 per cent were quoting deliveries longer than 12 weeks, while this year the number is 17.6 per cent.

Delivery in Weeks	Per Cent 1949	1950
Immediate	24.0	12.0
1 through 4	41.6	22.4
5 through 8	12.0	23.2
9 through 12	4.8	18.4
13 through 16	1.6	4.8
17 through 20	....	4.8
21 through 24	0.8	5.6
24 through 52	....	2.4
Total	84.8	93.6

The remaining percentages in the table are accounted for by replies that left the delivery questions unanswered or very general. Some of the manufacturers did not answer because strikes this year or last made it impossible to quote delivery dates, or the items were new this year. Those who gave general answers usually said "delivery indefinite", "all delivery dates extended", "delivery is worse", "delivery is longer and more uncertain", or "greater delay".

Delivery by Equipment Types

A breakdown of the replies by types of equipment found shovels, cranes, and excavators with the slowest deliveries and the greatest range of dates. The shortest period quoted by any manufacturer was 2 months; the longest, for large units, was one year. The average was about 5 months. Engines were right up there too, averaging 5½ months (last year they took 4 months at most and usually 1 to 2).

For dirt-movers and tractors, average delivery was 4 months. Trucks stood anywhere from immediate to 6 months, averaging 3½ months. Trailers took about 2 months. So did rollers.

Asphalt plants averaged out at 3 months, bituminous distributors at 1 to

(*Concluded on page 94*)

Match today's traffic (and tomorrow's) with

asphaltic concrete

Durable, easy-riding Asphaltic Concrete pavement on Absecon Boulevard, main highway to Atlantic City, N. J., constructed by The Eastern Engineering Company of Atlantic City.

Heavy-duty Asphaltic Concrete paving, thanks to its flexible, resilient qualities, has the ability to absorb and survive years of the most punishing traffic impact. To this exceptional durability, add a low upkeep cost, which makes Hot-mixed Asphaltic Concrete an economical pavement for important highways, principal streets and major airports.

Asphaltic Concrete paving is popular with motorists because its resilient, joint-free surface possesses a smooth-riding quality that lasts. Equally important to the motorist is the highly skid-resistant quality of Asphaltic Concrete, which contributes materially to his safety on the highway.

Other advantages of Asphaltic Concrete, which pay off in increased durability and lower upkeep cost, are its immunity to chemicals used for snow and ice removal in winter, and its ability to withstand peak temperatures of midsummer with no harmful effects due to expansion.

For complete information on Asphaltic Concrete and other types of asphalt construction, write our nearest office for copy of the booklet, "Texaco Asphalt Paving — Plant-mixed Types."

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17
Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Philadelphia 2 Richmond 19

TEXACO

TEXACO ASPHALT

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Reform Needed in Route Marking

The bewildered motorist blinking at a maze of signs at a busy highway intersection, trying to decide in a split second whether to go thisaway or thataway, is about to get a break—in New Jersey, anyway, where the State Highway Department is working to reduce the multiplicity of highway-marking signs. If simplification in signs can be achieved in New Jersey, where communities and roads have about reached the saturation point, similar results should certainly be possible anywhere.

Duplication of route numbers seems to be the chief cause of confusion to the motorist. The various states bequeathed the first numeral designations to their roads when they were built or incorporated into a highway system. Then in 1926 the Federal government gave numbers to its U. S. routes, with the principal north-south highways from the east to the west coast being issued the odd numbers 1 to 101 and the east-west arteries from the Canadian border to Mexico and the Gulf getting the even numbers.

In between this pattern of Federal routes are the interlacing state highways, usually with no system to the numbering. State numbers are also maintained on Federal routes, thus giving the same road two numbers. Overlapping of routes is common, so that a section of highway may have several numbers, both state and Federal, for a given stretch. This leads to the situation where signposts are cluttered with numbers—either in the familiar Federal shield-shape, or the state-type marker.

When the driver slows down, wavers, or stops to get his bearing at intersections so marked, a dangerous traffic hazard is also set up that may and often does result in accidents. New Jersey, which has as fine a collection of these numerical totem poles as any state, hopes to reduce the number of signs where practical, and still not withhold essential directions from the driver. Existing route numbers most commonly recognized will be retained; others will be dropped or shifted. Some 13,000 route markers in the state are expected to be reduced to approximately 9,000.

Other states would benefit from a look at their own system of highway markers with a thought to improvement. In many states the old horse-and-buggy method of placing signs parallel to the road is still followed, instead of having the marker face the driver so that he can see it as he rushes past. Many states do not identify towns and villages with name markers at the boundaries, that would help the tourist know where he is.

Winter, when construction slows down, is a good time for taking stock of shortcomings in this matter. The job of modernizing a state's route-marking system is no small task to be solved in short order. Thorough study and careful planning are essential. The principles and practices that have been followed for years in sign marking and placing should be closely scrutinized to see if they really furnish the best possible help and guidance to the motorist.

Along this line psychologists have just come up with a "new look" in numbers for use on road signs. They have altered the shape of every numeral except 1 (you can't do much with that) to make them easier to read at a distance. The 3 and the 8, which vision tests indicate are most often confused, were changed considerably to avoid any resemblance. New designs for the 5 and 6 also remove any similarity between them. Though radically different in appearance and—at first glance—rather startling, the new style in numbers makes them easier to read at present car speeds.

If the long-accepted configuration of our numerals can be questioned and proposed for reform, then the well-established route-marking systems employed by highway departments throughout the country can no doubt be improved too. It's time to give it a try. Good luck, New Jersey!

Hail to the Motor Grader

To no other piece of road machinery is so much owed by so many as to the well known motor grader. This ungainly-looking metal skeleton, running on four rubber-tired wheels and supporting a steel blade, would be the universal choice if highway maintenance men were forced to choose only one type of equipment with which to carry on their work. Thousands upon thousands of back-road miles in this country would be impassable if it were not for the old reliable "motor patrol" in the hands of skilled maintenance men.

After heavy rains have washed away the surface of sparsely traveled gravel and dirt roads, the isolated farmer is reassured by the sight of the motor grader out repairing the damage. Its operator holds the machine to a steady forward pace, for he has many long miles of road to patrol and shape up before satisfactory lanes of transportation are again made available to the countryside. He whirls the big control wheel, dipping the blade so that it erases the washboard corrugations and leaves in its wake a smooth-riding path.

Early in the spring one may see, along with the robins, a motor grader careening over a roadway slope at some crazy, crooked angle "pulling" a ditch, clearing it of the winter's debris so that the road will get the drainage necessary to its life. Or it may be out in the cold of winter, day or night, using its big versatile blade as a snow plow keeping a road open to traffic. Or it may be making a road where none has been before, shaping a roadbed to crown and grade, then adding a pavement of aggregate and bitumen which it has mixed. Or it may be keeping smooth some contractor's haul road over which big trucks rumble with dirt or concrete for levee or dam.

The motor grader is here, there, everywhere, manned by lonely operators who know how to exact the full capabilities from their equipment. Skilled road-builders, this team of man and machine, yet how futile one would be without the other. Truly if the motor grader did not exist, it would have to be invented.

Union Incompatible With PE Objectives

At its annual meeting held recently in Boston, the National Society of Professional Engineers approved a statement of principles regarding collective bargaining for professional engineers. Text of the statement follows in part.

"It is definitely unprofessional for a professional engineer, professionally employed, voluntarily to join a heterogeneous labor union, dominated by, or obliged to, nonprofessional groups . . . The individual responsibility and independent judgment required of a professional engineer are incompatible with the regimentation fundamentally inherent in unionization." This however is not to be "construed as a criticism of engineers who may be forced to join a labor union . . . but engineers in this predicament should seek to extricate themselves by due process of law." Nor, the board says, should it be construed "as a criticism of engineers-in-training, who voluntarily join a labor union when, as a step in their practical engineering training, they are temporarily employed in nonprofessional or subprofessional work, where their fellow workers are organized. When promoted to professional responsibilities, however, the engineer cannot continue his labor-union affiliations without sacrifice of professional status."

Second point made was that "Organizations of professional engineers for collective bargaining in any form are to be deplored, although their existence, for the present, may be condoned under certain circumstances." The board explains that "the compensation of an engineer should be in proportion to the value of his services and not based on his age, his degrees, or any other yardstick that can be applied collectively . . . When employers generally are persuaded that professional employees must be viewed as individuals and not in groups or classes, then NSPE may condemn collective bargaining by professional engineers, without qualification."

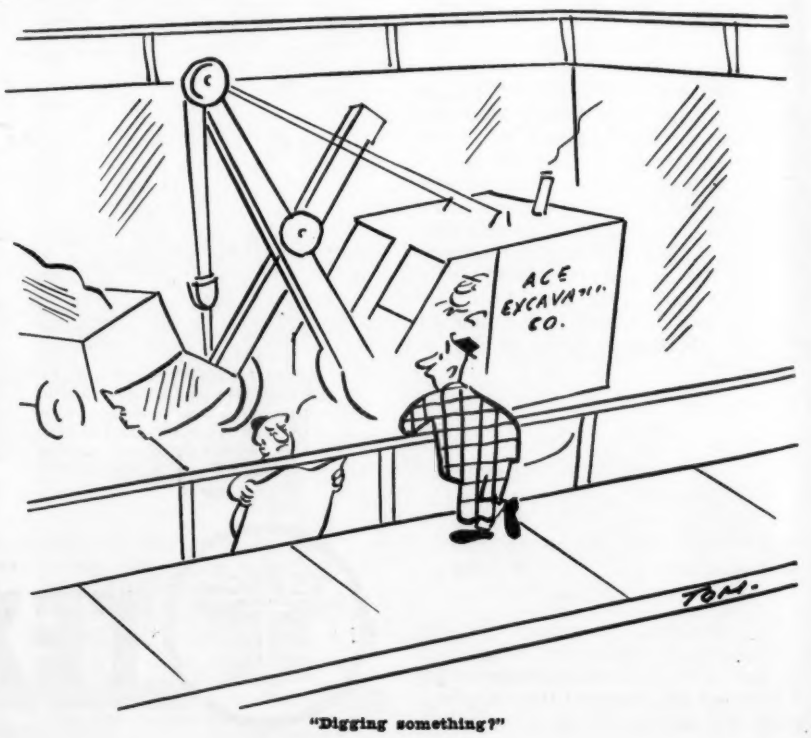
ASCE Centennial in 1952

From July 1 to September 30, 1952, the American Society of Civil Engineers plans to celebrate its centennial with an exposition and a convocation of engineers at the Museum of Science and Industry in Jackson Park, Chicago. There will be a permanent educational exhibit for the general public and the professional engineer, as well as temporary exhibits by engineering and industrial firms. Nearly a hundred other engineering societies will take part.

Program on Roadside Blight

An illustrated lecture called "Protecting Our Highways From the Roadside Blight" has been prepared by the National Roadside Council. It consists of 51 Kodaslides taken in ten states and an accompanying lecture-legend which describes the development and danger of the "blight" of uncontrolled ribbon business along the highway, and the methods used to check it.

The set of slides may be obtained from the National Roadside Council, 119 E. 19th St., New York City 3, N. Y., for $25.00; the lecture-legend on request.



"Digging something?"

Modern Store Built In Sidehill of Rock

Durable Stone Walls Present Neat Appearance on Two-Story John Wanamaker Building Near Wilmington, Del.

C. & E. M. Photo
This is the front of the Wanamaker store. Notice the stone walls around the entrance, with rubble-stone masonry running out to the two ends of the building.

✦ STONE, one of the oldest of building materials, has an important role in the new, ultramodern John Wanamaker store just constructed near Wilmington, Del. The foundation is on solid Brandywine granite; the sweeping front walls are Man-sota pink stone; while the sides and rear are built of Avondale rubble. The framework is of structural steel encased in concrete.

The big department store is on the corner of Augustine Cut-Off and Paper Mill Road in the town of Alapocas, just across Brandywine Creek from the city of Wilmington. Located in the suburbs, the new store has a terraced parking lot at the rear, for the convenience of shoppers, that will accommodate 2,500 cars. Surrounding walks are built with embedded heating coils to melt off snow and ice. Further refinements are year-round air conditioning, including the dehumidifying of air throughout the building.

Costing approximately $5,000,000, the store has two selling floors with a total 175,000-square-foot area. John McShain, Inc., of Philadelphia, the general contractor, got the construction under way in August, 1949, and the store was expected to be open for business by this month.

Founded on Rock

The site of the store is on a sidehill, with the main entrance in front leading directly into the first floor which is at elevation 156. From the rear, the entrance off the parking field is at second-story level, elevation 174; roof elevation is 192. Measured along the arc at its center, the building has a length of 500 feet from east to west, with a depth of 150 feet. The first floor in front has a long row of display windows protected by an overhanging canopy. Large windows in front at the second-floor level look out from the central staircase.

Subcontractor J. T. Ward of Wilmington handled the foundation excavation which included some 30,000 cubic yards of Brandywine granite. While the store has no basement, the rock was excavated in one place to a depth of 15 feet to accommodate the fuel-oil storage tanks. The average depth of excavation was 5 feet. All the rock was blasted out, six wagon drills being employed in drilling holes on 3-foot centers both ways. The holes were charged with Du Pont dynamite, and shot in groups of 12 to 14 holes. Heavy woven-steel mats were placed over the area being blasted to prevent rock from flying out on the street.

A 1½-yard shovel loaded the material into a fleet of dump trucks that hauled it away to a nearby abandoned quarry. Reinforced-concrete footings, averaging 8 feet square and 4 feet deep, were then poured within the rock and wooden forms, to support columns spaced on 30-foot centers both ways.

Steel and Concrete Framework

Structural steel for the store, totaling 627 tons, was fabricated by the Belmont Iron Works of Philadelphia, and erected by the McCormack Co. of Wilmington. The 12-inch steel H-beam columns and floor beams were erected by two cranes having 85 and 50-foot booms. Rivets tie the structure together. The columns are encased in concrete, poured within steel forms and later furred and plastered, with their final size being 24 inches in diameter.

The 7,000 cubic yards of concrete required for the building was delivered to the job in truck mixers from the Wilmington plant of Warner Central Mix Concrete Co. For the big pours as many as ten 5-yard truck mixers were engaged; concrete of 3,000 pounds to the square inch at 28 days was used throughout. The 365 tons of reinforcing steel placed in the concrete came from the Sparrows Point, Md., plant of the Bethlehem Steel Corp.

Concrete flood slabs for the first and second floors are 5 and 4½ inches thick respectively. On top of the rough finish, a Walker underfloor distribution system was installed for electrical outlets. This was enclosed within a pea-gravel dry-concrete fill and mortar topping. An Ozite pad was laid over the finished floor, followed by wall-to-wall carpeting.

One of the largest pours undertaken, 892 cubic yards, was finished in 8 hours. This included a part of the second-story floor slab, together with the encasement of beams and columns in that section. Concrete was distributed to the forms by buggies. Construction materials were raised to second-floor and roof levels by means of a 45-foot-high

(Continued on next page)

Common-Sense Equipment Protection during STEEL SHORTAGES

WITH SHORTAGES again threatening, Stoody Hard-Facing returns to war-time importance . . . the job of keeping equipment on the go, of combating all replacement scarcities by making the old parts do.

Surprisingly, Stoody Hard-Facing not only reclaims worn equipment, *but actually restores it to better-than-new condition* at less than new-part cost. Since only the areas of concentrated wear need protection, the job is simple and economical.

A part whose life is doubled—or tripled—not only conserves dollars but protects your precious inventory of spare parts when replacements become difficult or impossible to obtain.

Start making your steel go farther now with this common-sense protection . . . Hard-face all wearing parts with STOODY ALLOYS, touch up as required for ultimate life. It's your best insurance against wear at *all* times.

● *This illustration shows a worn RD-8 Tractor Idler wheel manually hard-faced with Stoody Self-Hardening. It outwore two new wheels. Application cost was only a fraction of replacement cost.*

● *Above are typical idlers automatically hard-faced with Stoody 105. Automatic welding insures greater smoothness and uniformity of deposit besides lowering cost.*

STOODY COMPANY 11936 EAST SLAUSON AVENUE, WHITTIER, CALIFORNIA

C. & E. M. Photo
A 45-foot-high Towermobile raises construction materials to roof level of the new Wanamaker store.

the second floor support the purlins on which is laid a precast-concrete roof. These ready-made planks are 3 feet long, 22½ inches wide, and 2½ inches thick, with tongue-and-groove edges. A total of 72,500 square feet of slabbing weighing 906,250 pounds was required for the job. The concrete planks were sealed with grout, then covered with an 1½-inch layer of Owens-Corning Fiberglas roof insulation. This was topped with a 20-year Barrett Black Diamond tarred-felt bonded roof.

Hung, plastered ceilings on both floors conceal the various service utilities and the air-conditioning outlets connected to a York 875-hp unit located on the first-floor level. The building is illuminated with 757 fluorescent lights, 10 feet long, recessed in the hung ceiling. Hot-air heat supplied by two H. B. Smith twin-tube oil-burning boilers is blown through the air-conditioning outlets.

The few windows in the structure have steel frames. Service facilities in-

(*Concluded on next page*)

C. & E. M. Photo
A rubble-stone wall, 16½ inches thick, is under construction at the rear of the store. The masons are working on Patent scaffolding.

Modern Store Built In Sidehill of Rock

(*Continued from preceding page*)

Towermobile. Curing was done with water.

Stone Exterior

Stone masonry exterior walls were built by subcontractor Albert D. Battista of Washington, D. C. The pink Man-sota stone, laid around the curving front of the store and extending part way along the sides, was quarried in Minnesota. The rectangular sections, 4½ inches thick, are backed by concrete brick to give the wall a total thicknes of 12 inches. Virginia greenstone, from Lynchburg, Va., cut to 1½-inch thickness, is used for trim, and for the risers and treads in all staircases.

Rubble-masonry walls, 16½ inches thick, comprise the remainder and greater part of the wall surface. The stone was quarried at Avondale, Pa., only 19 miles from the job site. The pieces were trimmed, then laid and bonded together with a 3 to 1 sand-cement mortar. The masons worked on Patent scaffolds.

Precast Roof

Steel trusses in both directions above

Use Electric Tools on Every Job

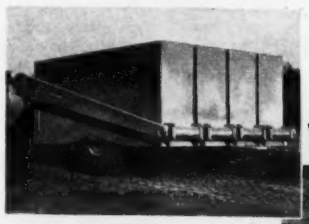
Carry, wheel, or truck 'em to any spot and plug in for all the electric power you need. Lightweight, Onan air-cooled electric plants supply power for electric drills, saws, planers, spades, tampers, lights . . . any electrical equipment. Lightweight A.C. models: 400 to 3,000 watts. D.C.: 750 to 5,000 watts. (Heavy-duty gasoline or Diesel plants to 75,000 watts.)

Write for Folder

D. W. ONAN & SONS INC.
4861 Royalston Ave., Minneapolis 5, Minnesota

Note how every print of each tire tread is uniform in depth and shape.

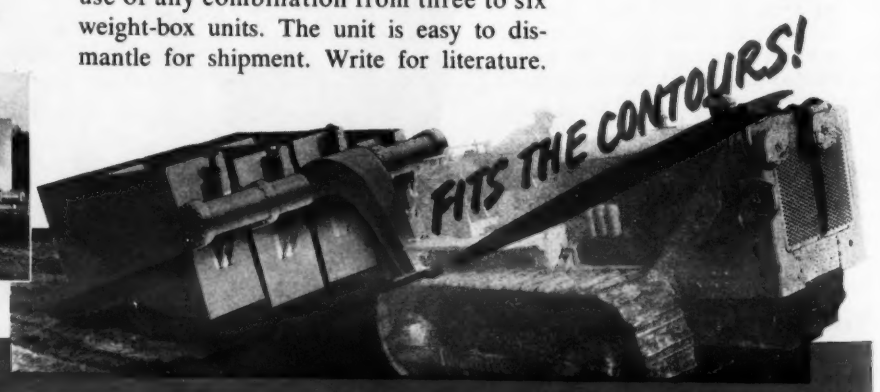
The weight-box units are hinged at the rear and oscillate independently.



For compacting earth fills!

UNEVEN GROUND CONTOURS cannot reduce the efficiency of the new Southwest Compaction Roller. As it travels over the variable surface of the earth fill each weight-box unit with its own wheel and tire oscillates independently up and down. Compaction is positively uniform because the weight on each tire remains constant—there is no bridging and no sudden shifting of load from tire to tire.

The sectionalized tubular yoke permits the use of any combination from three to six weight-box units. The unit is easy to dismantle for shipment. Write for literature.



CONSTRUCTION MACHINERY DIVISION

Southwest Welding & Manufacturing Co.

Alhambra, California

HAULING SCOOPS BULLDOZERS LOADERS BOTTOM DUMP WAGONS RIPPERS TAMPERS SCRAPERS TREE DOZERS

C. & E. M. Photo
A Clipper saw cuts a block of Metropolitan facing for the store.

clude a passenger elevator, a freight elevator, and an escalator—all Westinghouse. Nickel steel is used for handrails and trimming. Metropolitan facing tile is used liberally, particularly in the restaurant in a penthouse on the roof which commands a view of the Delaware River. Where necessary, the tile was cut to shape and size with a Clipper saw.

Landscaped Parking Field

To the north or rear of the store, the rocky hillside was benched out to form six separate terraces for the parking of cars. The cars enter the various levels from roadways along the side. Stair groups from the top terrace lead down into the store. The rock faces of the terrace slopes have been covered with dirt and topsoil, and the entire area surrounding the store is landscaped with grass and shrubs. The landscaping was done by W. Lee Moore, a landscape architect from Scarsdale, N. Y.

The mild 1949-50 winter in the Wilmington area permitted the construction to move ahead with good progress. In fact throughout the job, some activity went on every single work day. The safety record was also first-rate. Not a loss-time accident occurred, and at the peak of construction some 240 men were employed by the general contractor and the subs.

Personnel

The John Wanamaker store was designed by Massena and Du Pont, Wilmington architects. General contractor, John McShain, Inc., was represented on the project by Lou Edwards, Superintendent. John W. McAllister, Consulting Engineer, supervised the construction for the owner.

Ten-Ton Rear-Dump

A new 10-ton-capacity rear-dump has been announced by The Euclid Road Machinery Co., 1361 Chardon Road, Cleveland 17, Ohio. Designed for heavy-duty off-the-highway service, this diesel-powered Euclid has a payload capacity of 7.4 cubic yards heaped. Pulling power is provided by a Euclid double-reduction planetary drive axle. A 10-speed transmission offers a wide range of gear selection. Top speed with full payload is 35.7 mph.

Because of its body design, the Model 1UD can handle all types of material, the company says. The heavy body has a strong protective cab guard and a tapered chute at the rear so that the load is dumped clear of the drive wheels.

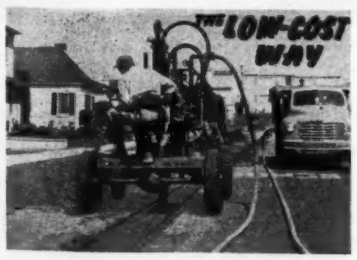
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 97.

Euclid's new 10-ton-capacity 1UD dumps sand and gravel into a portable crusher owned by J. L. Colville of Bryson City, N.C.

THE ANSWER TO THE ENGINEER'S PRAYER

BREAKS CONCRETE FASTER

TAMPS BACKFILL BETTER AND FASTER FOR LESS



THE NEW, MORE POWERFUL

MIGHTY "B" MIDGET

Fastest Pneumatic Concrete Breaker and Backfill Tamper. Replaces all the dirt removed after pipe has been laid.
Gives you high density compaction. Ready to repave immediately. No temporary paving. No spoil dirt to haul away. Due to high density compaction, requires little asphalt in replacement. Cuts cost of tamping and breaking of concrete many times. Can be worked manually or automatically.. 160' Compressor for full capacity or 105' Compressor for ½ capacity. For further particulars, see your nearest dealer, or write Department C.

R. P. B. CORPORATION
2751 East 11th Street Los Angeles 23, California

A SURE BOND OF PROTECTION for Concrete Jobs

Republic's Diamond ◇ Design Concrete Reinforcing Bars

...are designed to exceed requirements of the first standard specification covering concrete bar deformations—"Minimum Requirements for the Deformations of Deformed Steel Bars for Concrete Reinforcement"—ASTM Specification A-305-49 adopted June, 1949.

Lugs or deformations are higher and more closely spaced than before—without change in standard foot weights—see table below.

This means better bonding properties, better anchorage in concrete than ever before—possible savings in steel, in bending, in installation.

Made from new billet steel only, these bars are rolled at Cleveland, Buffalo, South Chicago and Gadsden. Write for further details.

REPUBLIC STEEL CORPORATION GENERAL OFFICES—CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, New York

Size Number	Cross-Sectional Area, sq. in.	Nominal Diameter, in.	Foot Weight, lbs.
3	0.11	0.375	.376
4	0.20	0.500	.668
5	0.31	0.625	1.043
6	0.44	0.750	1.502
7	0.60	0.875	2.044
8	0.79	1.000	2.670
9	1.00	1.128	3.400
10	1.27	1.270	4.303
11	1.56	1.410	5.313

REPUBLIC STEEL

Republic
CONCRETE REINFORCING BARS

Raytheon's UM 30 two-way radiophone comes in dual and single-channel models covering the entire 152 to 174-mc frequency range. It is said to meet all FCC requirements.

New Two-Way Radio For Mobile Field Use

A new two-way mobile radiophone for field use by contractors and highway departments has been developed by Raytheon Mfg. Co., Waltham 54, Mass. A complete system, ready for installation, it consists of a transmitter-receiver unit, power supply-control unit with built-in speaker, a military-type microphone or French-type hand-set, a cab-top antenna, and all necessary cables, connectors, and mounting hardware.

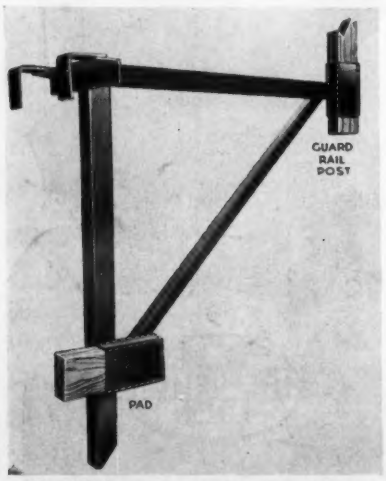
The UM 30 is available in both dual and single-channel models covering the entire 152 to 174-mc frequency range. The control unit, with power supply and built-in speaker, is compact and can be easily attached to an instrument panel. The unit is 4⅞ x 5½ x 8½ inches. The transmitter-receiver measures 5½ x 6⅞ x 15 inches and can be mounted out of sight and out of the way in a corner of the trunk compartment or cab. The system is said to meet all FCC requirements, including adjacent-channel operation and modulation limiting. The company points out that with a flick of the switch the new unit puts the driver or equipment operator in instant contact with a central office. Schedules can be changed or equipment redeployed quickly. Applications on spread-out construction jobs and for snow-fighting are apparent.

Raytheon also offers complete station equipment. This includes transmitting-receiving equipment for 30 or 60-watt station systems. The Model US 60-1-LC control console is said to contain all necessary features of a fixed-station control unit. Equipment for wall or rack mounting is also available.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 109.

All-Steel Wale Jack For Scaffold Support

A new all-steel wale jack, designed for scaffold support on all types of concrete construction using horizontal wales, has been developed by the Superior Scaffolding Co., 5634 Bankfield Ave., Culver City, Calif. According to the company, the steel wale jack has several features not inherent in wooden wale brackets. Its all-welded steel construction will not loosen up in use. It has a double hook at the top which acts as a safety factor distributing the load on the wale and eliminating sidesway.



All-welded steel construction and a double hook at the top to distribute the load and eliminate sidesway are features of new Superior Scaffolding Co. wale jack.

The new bracket has provision for a pad at the bottom so that a 2 x 4 may be slipped in to hold the scaffold away from the wall when it is used on the bottom wale. It is equipped with a slot for guardrail uprights, and the guardrail post may be carried through to connect up several brackets. The new wale jack has been designed for use as a utility scaffold on bridges, dams, abutments, concrete walls, etc.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 112.

Littleford's 84-ML heating kettle weighs two-thirds less than its 84-MS but holds just as much—30 gallons.

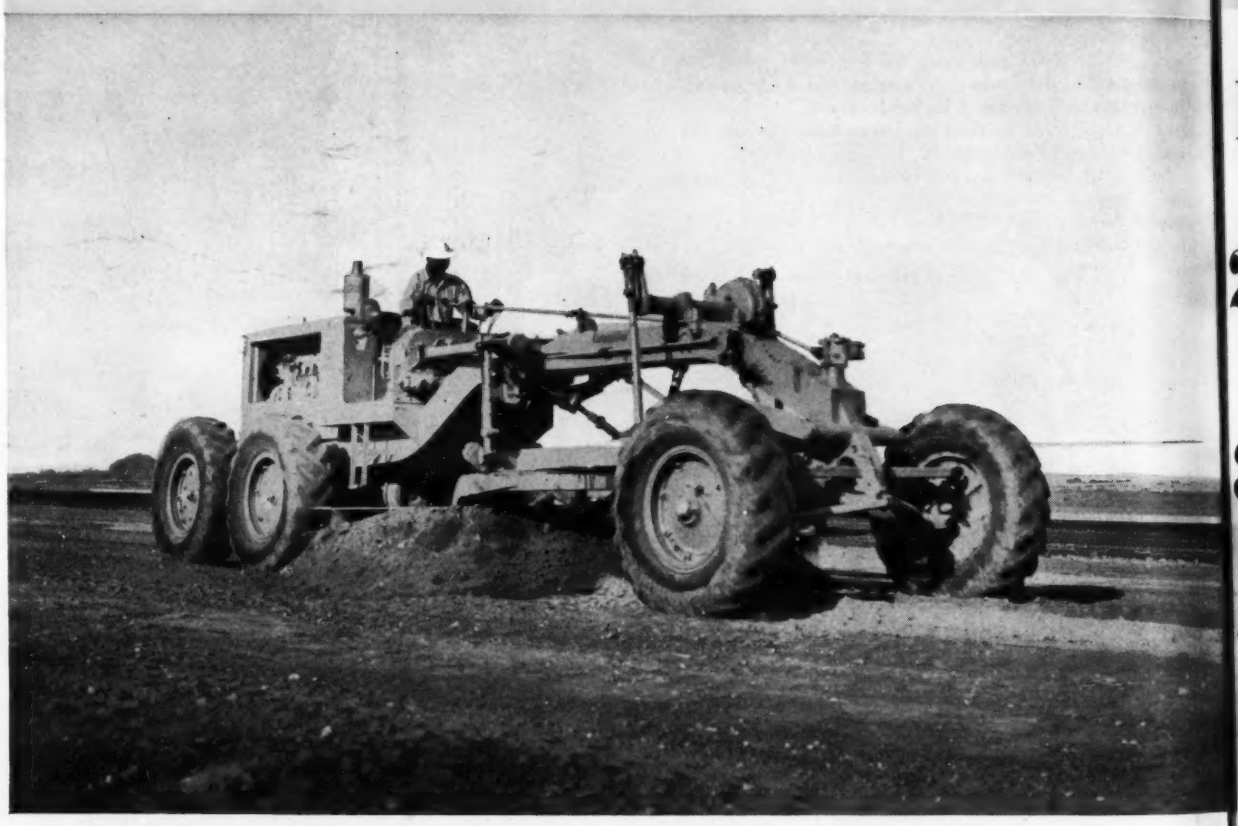
New Heating Kettle Lighter in Weight

The new Model 84-ML stationary heating kettle, a revamped design of the original 84-MS, weighs 105 pounds as compared to 330 pounds for the MS, according to a recent announcement by Littleford Bros., Inc., 485 E. Pearl St., Cincinnati 2, Ohio. The company points out that although the weight has been reduced approximately two-thirds, there is no difference in the capacity of the two kettles, both holding 30 gallons of melted material. The reduction in weight, for the same capacity, is designed to give greater portability to the unit, for transport from job to job.

The Model 84-ML consists of a lightweight furnace shell with four pipe legs, a removable melting tank with separate cover, a No. 58 burner, a 6-foot hose, and a 4-gallon lightweight fuel tank. A 1½-inch standard draw-off cock is also provided.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 61.

THE Grader



EXCLUSIVE bonus features, found only on "Cat" Diesel Motor Graders, make these balanced machines the best you can put on your payroll.

Of his "Cat" No. 12 Motor Grader, which moved more than 30,000 cubic yards of earth during the construction of the Contra Costa County Airport near Concord, Calif., owner Eugene G. Alves says: "I've operated 'Cat' equipment all my life. As far as I'm concerned, nothing can touch it; it's tops in equipment!" And Mr. Alves backs up his opinion by standardizing 100% with "Caterpillar" tools to cut down time to the bone and get better job results.

On the Contra Costa Airport job, the "Cat" No. 12 Grader has built roads, done grading and drainage structures, and made parking areas. With its engine, clutch, transmission, final drive and blade mechanism all *designed* and *built* by "Caterpillar," the machine has the balance and under-the-hide stamina to keep going the way you *hoped* it would when you bid on a job.

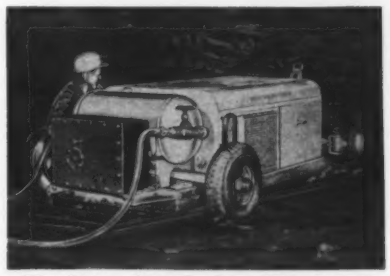
By the smooth, easy way "Caterpillar" Motor Graders work, you *know* that their left wheels know what their right wheels are doing. Ask your "Caterpillar" dealer to show you the "Cat" Motor Grader's exclusives.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

Tunnel Compressors

A new line of tunnel air compressors, especially designed to handle all types of roof-bolting work, is announced by Davey Compressor Co., Kent, Ohio. Units are available in four standard two-stage sizes to deliver 105, 160, 210, and 315 cfm at 100-pound pressure. Each of the four models is made in either self-propelled or towable design.

Feature of the new compressor is its low overall height: 32 inches for the Model 105; 33 inches for Models 160 and 210, and 37 inches for Model 315. Standard compressors are equipped with pneumatic tires and automotive steering. Special axle and front-end design permits 30-degree turns. Flanged steel wheels are optional equipment.



The Davey tunnel air compressor at work. The four models feature 32 to 37-inch overall height.

All compressor working parts are totally enclosed in a metal housing with side-panel air filters. This exclusive feature contributes greatly to increased compressor life and operating efficiency, Davey says. Other compressor features include Davey valves, oil-pressure safety switch, full force-feed lubrication, and built-in unloader system.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 55.

Penn Salt 100 Years Old

The last of September, the Pennsylvania Salt Mfg. Co. celebrated its 100th anniversary with luncheons, dinners, and tours for company shareowners, employees, and business friends at its Whitemarsh Research Laboratories at Chestnut Hill near Philadelphia. The last two days of the festive week were devoted to the first meeting in the company's history of the entire sales force.

The Tennant joint-cleaning and grooving machine with its new adjustable third wheel and tire-moistening device.

Three Accessories For Joint Cleaner

For faster, easier operation of its joint-cleaning and grooving machines, the G. H. Tennant Co., 2530 N. 2nd St., Minneapolis 11, Minn., has developed three new accessories.

An adjustable third wheel allows more accurate control of cutter "bite". The wheel bolts to the drum housing of the machine and includes a screw adjustment which raises or lowers the cutting head. It is designed to make the machine easier to operate, allow the use of larger 4¾-inch cutters, and reduce wear of the cutter-head rim.

The second accessory is a tire-moistening device to keep bituminous material from sticking to the tires in bumpy layers—often a problem in hot weather. It consists of a 4-gallon water tank, valves, and feed pipes for dripping water on the tires.

The third improvement is a ⅜-inch steel towing frame that can be attached in 2 minutes. It hooks over the axles of the joint cleaner and locks, to permit towing behind a truck or car. All three accessories may be installed in the field.

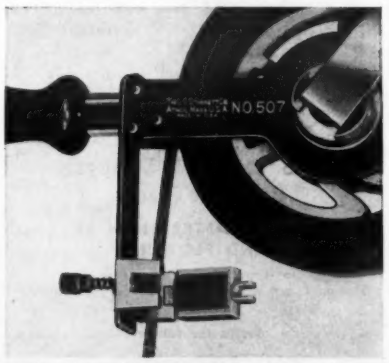
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 7.

Cleans and Protects Your Measuring Tape

The Tape Wiper developed by The L. S. Starrett Co., Athol, Mass., attaches to any Starrett frame-type tape and is designed to wipe the line clean of oil, mud, or other dirt as it is reeled in. It can be attached permanently or only on dirty jobs. It mounts on the stud which secures the hand grip to the tape frame.

The wiper is of one-piece construction with no loose parts. Pads held in uniform contact under spring pressure wipe both sides of the tape ribbon clean. A bayonet lock permits the upper pad plate to be released and swung aside to facilitate pad replacement or removal of the wiper. Six extra pads are supplied with the wiper, and more are available.

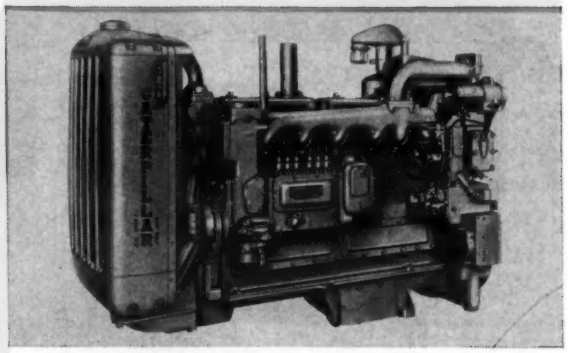
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 86.



The Starrett tape wiper wipes tape lines clean of dirt as they are reeled in.

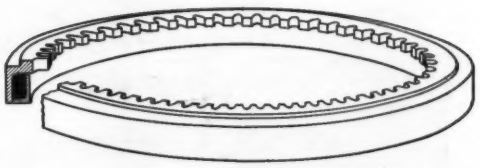
THAT'S IN A CLASS BY ITSELF

1 ***ONLY*** **"Cat" Graders have "Cat" Diesel Engines for continuous service and economy of operation. It's part of balanced design that saves you operating dollars.**

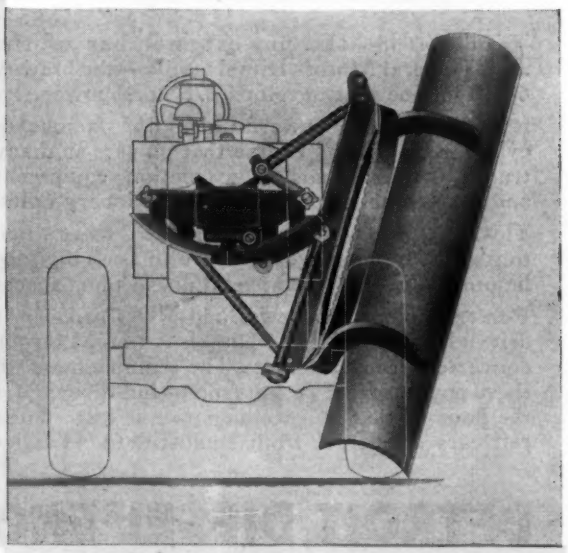


2 ***ONLY*** **the "Caterpillar" Motor Grader line has no orphans. Stocks of parts are maintained for each member of the "Cat" Grader family regardless of age. They work in harness—not die on the vine. Your original investment is protected.**

3 ***ONLY*** **"Cat" Graders have a box-section blade supporting circle, made from a special angle produced on a "Caterpillar"-owned roll.**



4 ***ONLY*** **"Cat" Motor Graders provide such excellent visibility for the operator. Power control box is mounted low, lift gear is mounted against the dash. Clean frame design permits the operator to see toe and heel of the blade, sitting down.**



5 ***ONLY*** **"Cat" Graders have the long radius curved side shift rack that provides extra lateral shift to the blade assembly, together with the required vertical movement.**

6 ***ONLY*** **with "Caterpillar" equipment do you buy-in on the world-wide "Caterpillar" dealer service—adequate parts inventory and factory-trained servicemen to keep wheels, tracks and engine turning on location.**

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

Maintenance Vital, Says Road Engineer

County Engineer Observes Road Trends for 36 Years and Draws Sound Conclusions About 1950 Maintenance

✦ THE evolution of the average county road system reflects life from the cradle to the grave.

Roads begin to influence a child's life with the milk truck, which brings him nourishment. Later, when a child's education begins, the school bus enters the picture. The mail delivery trucks, traveling over roads, serve the living adult. And when a man is dead, his coffin travels over roads to the cemetery.

That is the picture painted by Menton Hannah, County Engineer at Waco, Texas. Hannah, who has directed county road work in McLennan County since November, 1914, and who is perhaps as close to the county road picture as any engineer of his group. For Hannah is close to the national activities of ARBA and AASHO, and for nearly 40 years has participated actively in road engineering affairs.

His county today has one of the best-maintained highway systems in the state, and yet Hannah can remember distinctly when mules, feed bags, and team-drawn blades were used.

"It was all horse-drawn vehicles in those days," Hannah reminisces. "But look at the county today."

As a matter of fact, McLennan County will bear a long look, for it is typical of many a county in the nation.

Hannah loves to demonstrate his thought that the community life of a county revolves around its roads by taking the visitor around to show him what he means. For example, the famous Youngblood Restaurants of Austin, Waco, and Dallas operate a huge poultry-packing plant in Waco. The 6,000 chickens per day which this plant processes come in from every corner of the county. They have to arrive on very close schedules. The county road system makes it possible.

He Beat the Precinct System

McLennan County still runs its maintenance department by the old precinct system, but in many ways most of the disadvantages of that system have been eliminated. All specialized equipment is equally divided and so is the work load, which means that a dragline and trucks in one precinct have steady work. They are not permitted to be idle while some other precinct might need them.

The headquarters shop with stock parts is centralized in Waco, and equipment repair is controlled from one point. So far as the organization goes, it is also controlled centrally for all practical purposes, because meetings of the four commissioners in Waco are frequent, and there is close liaison be-

(*Continued on next page*)

McLennan County Highway Dept. Photo

The inside of the central McLennan County shop in Waco, Texas.

This is the Diesel that speeds the big jobs

HERE IT IS—the newest member of the General Motors Diesel family—the brawny 6-110 engine that develops 275 horsepower.

It is 50% more powerful than the famous 6-cylinder GM "71" engine that powers so many trucks, buses, boats, construction equipment and other mobile, portable and stationary units.

This rugged new Diesel doesn't care what's tied to its tail. It has power to spare to keep big jobs humming, yet is so compact it doesn't hog space.

For example, each new Budd RDC rail car is driven by a pair of 6-110 Diesels with GM torque converter transmissions. The compactness of these power plants permits mounting them under the floor so that no revenue space is lost. These rail cars accelerate from standstill to 44 miles per hour in just one minute and have a top speed of 83 mph with a full load.

Like all other GM Diesel engines the 6-110 is two-cycle—delivers power on every piston downstroke. This advanced design cuts down Diesel size without sacrificing ruggedness; it insures fuel economy, lower maintenance costs, exceptional dependability and long life.

The GM 6-110 engine provides Diesel power at its best for heavy-duty jobs—not only for rail cars but in the largest mountain-type trucks, huge rock crushers, deep-sea fishing and pleasure boats, big pumps and compressors, mining and oil field equipment. *It is an exceptionally compact Diesel for its horsepower—an engine that gives remarkably fine performance in minimum space.*

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES . . . Up TO 275 H. P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS . . . Up TO 800 H. P.

GENERAL MOTORS

Hear HENRY J. TAYLOR on the air every Monday evening over the ABC Network, coast to coast.

Only GM Diesels provide all these advantages

Compact size—less weight per horsepower . Two-cycle smoothness, power on every downstroke . Quick starting, on its own fuel . Unit injectors—no high-pressure fuel lines . Rapid acceleration . Cleaner burning . Better high-altitude performance . Easy accessibility.

GM GENERAL MOTORS DIESEL POWER

"Your Key to Power Economy"

SYNTRON

VIBRATING FLOATS

vibrating a stiff dry mix will give you

30% to 40% Stronger Concrete Floors

5 TIMES FASTER THAN BY HAND FLOATING

Do a better job, faster—Customer satisfaction with better, stronger floors.

Write for folder

SYNTRON CO.

227 LEXINGTON, HOMER CITY, PA.

C. & E. M. Photo
McLennan County Engineer Menton Hannah solos for the C&EM camera in his office at Waco, Texas.

have dug from over 100 pits over the years. The gravel is hauled back out to the roads to replace fines that were lost. It is a year-round operation.

Maintenance forces also improve the drainage characteristics of many of the old roads by building new side ditches. Invariably this pulls up a great deal of excess material on the road. This is removed by a new Athey Force Feed Loader, which travels from precinct to precinct.

The combination of this machine and trucks on excess material, draglines and trucks on new material, and motor graders of various sizes for routine maintenance is working well. Hannah's men round out good methods by careful attention to preventive maintenance, which is the other half of successful road doctoring.

Asphalt roads also get their share of maintenance. These roads in general are stage construction, consisting of improvement work on previously built gravel bases. The asphalt is either road-

(*Concluded on next page*)

tween the commissioners and the County Engineer.

A recapitulation of the county road system in the accompanying table shows the distribution by types.

Type	Precincts 1	2	3	4	Total
Graded earth	48.68	47.79	53.83	28.75	178.85
Gravel	248.25	244.97	201.05	357.16	1,051.43
Asphalt	62.89	56.30	48.63	75.75	243.57
Concrete	2.70	3.57	0.74	0.10	7.11
Totals	382.52	352.83	304.05	461.76	1,480.98

A careful analysis of that table tells a story in itself. All but 12 per cent of the county road system is now all-weather. Hannah's department, with about $340,000 to spend each year, keeps the system graded, drained, and maintained. As is the case with many a county engineer, Hannah tries to get some asphalt down each season where the roads deserve it, and resists pressure where the roads do not justify the higher-type surface.

"Last year we unloaded 27 cars of asphalt," he explained. "About 75 per cent went in new construction, but the more mileage of asphalt surface you lay, the more goes for maintenance."

The worst offenders in the traffic line, so far as road deterioration is concerned, are the new-type school busses which haul 60 to 70 pupils. Oilfield trucks are another problem. When they use the highways, maintenance costs jump.

Routine Maintenance

McLennan County maintenance is scheduled so that all roads receive frequent attention. The county has passed the era where tractors have a part in maintenance, and today there are only two tractors on the roster. Maintenance is done primarily by motor graders.

The optimum section for one grader is about 160 miles, and Hannah's crews work somewhere close to that figure. There are 20 motor graders of all makes and sizes, from Caterpillar No. 12's down the line. These machines are *scattered around* in small permanent locations all over the county, and never come in to Waco unless major repairs are necessary.

"Maintenance means regular blading," Hannah explains. "Unless you windrow your big rock on both sides, how can you hold the fines from running off in the first good rain?"

A good question, too. A typical McLennan County road has a small windrow of coarse particles at each side during dry weather, and is bladed smooth and tight again after each rain.

Hannah's men try to blade each road in their district at least once a week.

Maintenance, however, is not complete with the mere blading. The fines which blow away as dust have to be replaced. In each precinct there is a ⅜-yard dragline or shovel and several dump trucks. There is plenty of good gravel in the county, and road men

HERE'S A FASTER, EASIER, CHEAPER WAY TO HANDLE MORE DIRT, ROCK OR GRAVEL!

OMAHA STANDARD TRAILERS

The OMAHA STANDARD "CENTER DUMP" Trailer . . .

. . . Custom Built to Job Requirements is designed for contractors who want to haul dirt, gravel, rock, long or short distances, quickly and at low cost, for stock piling, spreading or dumping. Contractors say it is just what they have been looking for!

★ Each unit built to job requirements.
★ Available in sizes and lengths to meet all bridge and axle laws.
★ All *steel welded* body, chassis. Built to withstand roughest loading, toughest service.
★ Dumping mechanism FOOL-proof—trouble-FREE!
★ Release on doors INSTANT, SHOCK-PROOF, protected from material flow.
★ DOOR OPENING Meter control that can be *pre-set*.

Write at once for specifications and descriptive folder that will answer your questions and show how you can make every load a "profit" load. Address today—

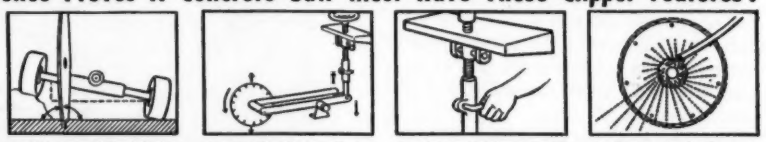
OMAHA STANDARD FACTORY & GENERAL OFFICES 2411 West Broadway Council Bluffs, Iowa

SAW CONCRETE OR ASPHALT WITH AMAZING

Clipper® CONCRETE SAWS

Saw 12 feet per minute in Asphalt or 5 feet per minute, 1 inch deep, in cured limestone Concrete. With Clipper you can saw up to 6½ inches deep. Concrete Sawing is Practical and Profitable because Clipper Concrete Saws are Built with the experience of World's Largest Manufacturer of Masonry Saws.

Experience Proves A Concrete Saw Must Have These Clipper Features:



1. Clipper "No Bind" Floating Three Point Suspension Automatically protects blade.
2. Positive Screw Feed Instant control raises or lowers blade smooth, easy.
3. Adjustable Depth Lock Set this handy stop for whatever depth desired.
4. Patented Spray Control Its value is measured in increased Blade Life.

Model C-130 Power Packed

4 wheel — Perfect Control, tips back and turns on a dime.

THREE ENTIRELY NEW MODELS

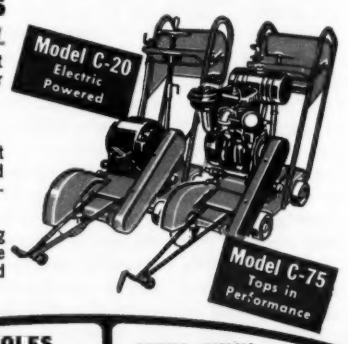
FAST — EFFICIENT — ECONOMICAL

Clipper Concrete Saws *CUT* through the toughest concrete, wherever patches, trenches, openings or contraction joints are needed.

SAW BEFORE YOU BREAK . . .

Eliminate radial cracks. Stop spalling. Have perfect jobs. Architects, Consulting Engineers, City and State Engineers are solving their problems by specifying "Saw before Breaking"

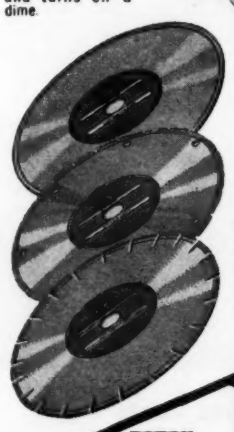
Utility Companies enjoy lower costs while improving Public Relations. Concrete Contractors praise the ease of getting the tough job done with new found profits!



Model C-20 Electric Powered

Model C-75 Tops in Performance

Patent Numbers 2338318, 2455113, 2492694 — Other Patents Pending—Printed in U.S.A.



GENUINE CLIPPER DIAMOND BLADES

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Maintenance Vital, Says Road Engineer

(*Continued from preceding page*)

mix cake, or penetration treatment.

At the Waco yard there are two asphalt-storage tanks with heating equipment. Two grades of asphalt are used: MC-1 for road-mix primer, and RC-2 for top work. Premixed patch material and limited amounts of upper decking are made in the Waco yard on a mixing table, because many of the asphalt roads are naturally close to the largest city in McLennan County.

Most of the asphalt maintenance is caused by base failure of some sort, which means that potholes have to be patched, edges filled in, and upper-decking or "halfsole" work done. The County has two pressure distributors for asphalt maintenance.

The asphalt tanks are at the main yard where the shop building is located. It is an 80 x 120-foot brick and tin building, built in 1940 by WPA. In it are tools for repairing all equipment, and a stock of parts. There are no lathes or unusually large machines.

Hannah insists there is no particular secret to county road maintenance except the will to keep abreast of the times on a national scale, and a good organization that's willing to work.

The McLennan County Commissioners Court is headed by Judge Mackie Walker, and the Commissioners are Dero Shockley, Louis Kramr, Winn Nichols, and Desha Taylor.

Decals Used to Note Proper Tire Pressure

Decals created by Palm, Fechteler & Co., 220 W. 42nd St., New York, N. Y., are being placed on the fenders of all cars and trucks operated by the Sordoni Construction Co., of Forty Fort, Pa., to indicate the correct tire pressure of the particular vehicle.

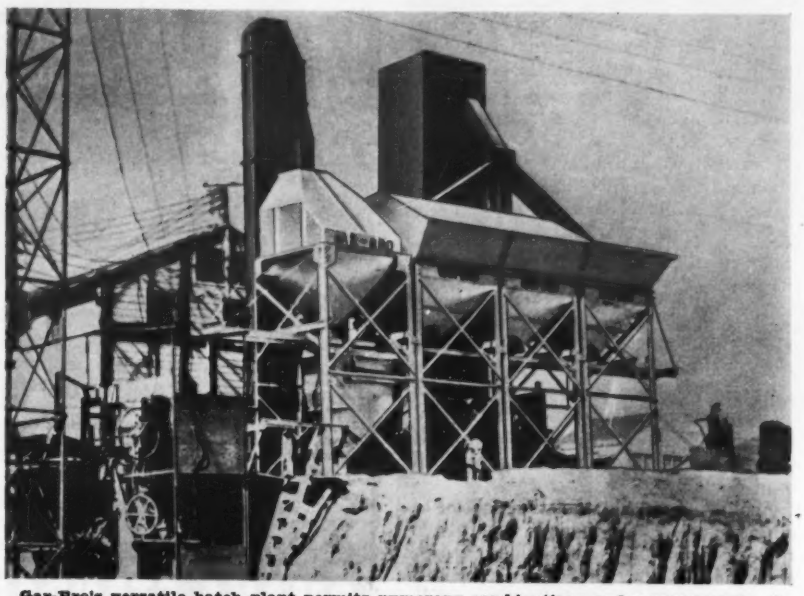
Andrew J. Sordoni, President of the company, stated that the correct tire pressure and the maintenance of that pressure considerably affects the cost of maintaining his large fleet of trucks and passenger vehicles. "Today's extra-soft balloon tires give extra mileage and efficiency if they are kept constantly at the recommended pressure", Mr. Sordoni explained. "The decals, although inconspicuous, give our drivers and maintenance people the information they need to assure us that the tires on our trucks and cars are being filled to the correct pressure for maximum efficiency. . . . We expect to realize a substantial annual saving of maintenance costs and will carefully tabulate our results", added Mr. Sordoni.

Further information may be secured from Palm, Fechteler & Co. Or use the Request Card at page 16. Circle No. 43.

Unit Batching Plant

A new unit batch plant incorporating numerous combinations and applications for aggregate and bulk-cement storage and batching has been developed by Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles, Calif. The plants, built in a capacity to handle the charging of 1-yard or smaller mixers, come in single or dual aggregate units which may be hooked up in series with a bulk-cement bin, and with an auxiliary cement silo if additional storage is required. Upon the completion of a particular job the units may be rearranged to meet other conditions.

A weigh hopper, mounted on a double-rail track, travels from bin to bin without interruption and may be set to dump from either side or either end. The new unit batch plant features bin frames mounted on skids or demountable wheels for easier transporting. An added feature is self-closing bin gates.



Gar-Bro's versatile batch plant permits numerous combinations and arrangements of aggregate and cement storage units to meet job conditions.

The versatility of the plant reduces equipment inventory and aggregate and cement storage costs, Gar-Bro says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 33.

Hand-Held Rock Drills

A new bulletin, H-1200-B38, on hand-held rock drills has been prepared by Worthington Pump & Machinery Corp., Harrison, N. J. The WS-45 drill, which it describes and pictures, has a cylinder bore of 2⅝ inches, a 52-pound weight, and 19-inch length. The WS-55 has a cylinder bore of 2⅝ inches, weighs 62¾ pounds, and is 20½ inches in length. The third drill described is the WS-30 drill. It has a cylinder bore of 3 inches, is 83 pounds in weight, and is 23¾ inches long. Design features are described and screw-feed mountings specified in the bulletin.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 31.

Other Places to Reduce Costs
Reduce chassis upkeep costs by lubricating with Texaco Marfak. It stays in the bearings, gives longer-lasting protection against wear and rust. More than 350 million pounds of Marfak have been sold!
Reduce wheel bearing maintenance costs with Texaco Marfak Heavy Duty. It guards against rust and wear for extra hundreds of miles. No seasonal change necessary.
Reduce costs of crawler track maintenance by lubricating with Texaco Track Roll Lubricant. It seals out dirt and moisture. Gives lasting protection.
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Convertible Shovel And 12½-Ton Crane

A new 12½-ton truck-mounted crane-excavator has been announced by the Wayne Crane Division of American Steel Dredge Co., Fort Wayne, Ind. The new Model 40 truck crane has a swing speed of 6.4 rpm, travels at truck speeds, and converts to all crane and shovel attachments.

Wide-flanged deep-section I-beam frames provide the crane base. Equalizing beam-type suspension and a locking third differential make possible off-the-road work. An auxiliary transmission provides 10 forward and 2 reverse speeds. The Model 40 lifts, booms, and swings either simultaneously or independently. Standard power unit is a 6-cylinder gasoline engine which develops 105 hp at 3,200 rpm. Other gasoline and diesel engines are available.

The upper works of the new machine are enclosed in a weatherproof inside-bolted cab of a design which permits inside access to all deck machinery.

The Wayne Model 40 truck crane has a swing speed of 6.4 rpm, travels at truck speeds, and converts to all crane and shovel attachments.

Other features include unit replacement of all subassemblies, a built-in counterweight to shorten rear-end clearance of the cab, 16-inch diameter drums for increased life of the wire rope, and antifriction bearings throughout. The base plate is held by adjustable conical hook rollers which revolve around a 48-inch-diameter replaceable ball-bearing race. Standard power unit for the Model 40 upper works is a 62-hp 6-cylinder gasoline engine. However, any of several makes of diesel or gasoline engines of required power and speed may be furnished on customer's specifications.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 96.

Aluminum Rolling Scaffolds

A new bulletin on aluminum sectional rolling scaffolds is available from Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City 1, N. Y. It includes specifications and photographs of scaffolds in actual use. It describes their prefabricated construction and their uses. Lightness, ease of erection, durability, and adaptability to many services are features claimed for the system.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 57.

CONCRETE REINFORCING STEEL INSTITUTE
38 SOUTH DEARBORN STREET, CHICAGO 3, ILLINOIS

STANDARD A305 REINFORCING BARS

BAR SIZES		WEIGHT	NOMINAL DIMENSIONS — ROUND SECTIONS		
OLD (INCHES)	NEW (NUMBER)	POUNDS PER FOOT	DIAMETER INCHES	CROSS SECTIONAL AREA SQ. INCHES	PERIMETER INCHES
¼	2	.167	.250	.05	.786
⅜	3	.376	.375	.11	1.178
½	4	.668	.500	.20	1.571
⅝	5	1.043	.625	.31	1.963
¾	6	1.502	.750	.44	2.356
⅞	7	2.044	.875	.60	2.749
1	8	2.670	1.000	.79	3.142
1	9	3.400	1.128	1.00	3.544
1⅛	10	4.303	1.270	1.27	3.990
1¼	11	5.313	1.410	1.56	4.430

The new bar numbers are based on the number of eighths contained in the nominal diameter of the bar.

Bar number 2 is plain rounds only. Bars numbered 3, 4 and 11 are round bars and equivalent in weight and nominal cross-sectional area to the old type 1", 1-1/8" and 1-1/4" square bars.

The above weights are adopted as standards by the Institute in 1934 and supersede former practice.

These weights have been approved through the U. S. Department of Commerce Simplified Practice Recommendation R 29-50.

This new "Bar Card" shows standard weights and numbers for steel reinforcing bars.

Specification Chart For Reinforcing Bars

A new "Bar Card" covering the latest ASTM Specification A-305 for reinforcing bars is offered free of charge by the Concrete Reinforcing Steel Institute, 38 S. Dearborn St., Chicago 3, Ill.

The card serves as a ready reference chart of weights (pounds per foot) and nominal dimensions (diameter, cross-sectional area, and perimeter) for the standard sizes of steel reinforcing bar from ¼ inch through 1¼ inches. Bar sizes are listed in both the old system (inches) and in the new (numbered) system recently recommended by the U. S. Department of Commerce.

Made of stiff cardboard, the card is 8½ x 11 inches for binding in looseleaf notebooks or hanging on the wall. Listed on the back are standard ASTM designation numbers for reinforcing bars, including those covering grades of steel and deformed bars.

This card may be obtained from the Concrete Reinforcing Steel Institute. Or use the Request Card at page 16. Circle No. 70.

Produces New Chemical For Soil Stabilization

The first commercial production of glacial acrylic acid is announced by B. F. Goodrich Chemical Co., 324 Rose Bldg., Cleveland 15, Ohio. The acid is used in the preparation of solid monomers such as sodium and calcium acrylates, and other metallic salts of acrylic acid. Calcium acrylate is now being tested by U. S. Army engineers as a soil-stabilizing agent to harden muddy or clay surfaces of emergency airfields and roads.

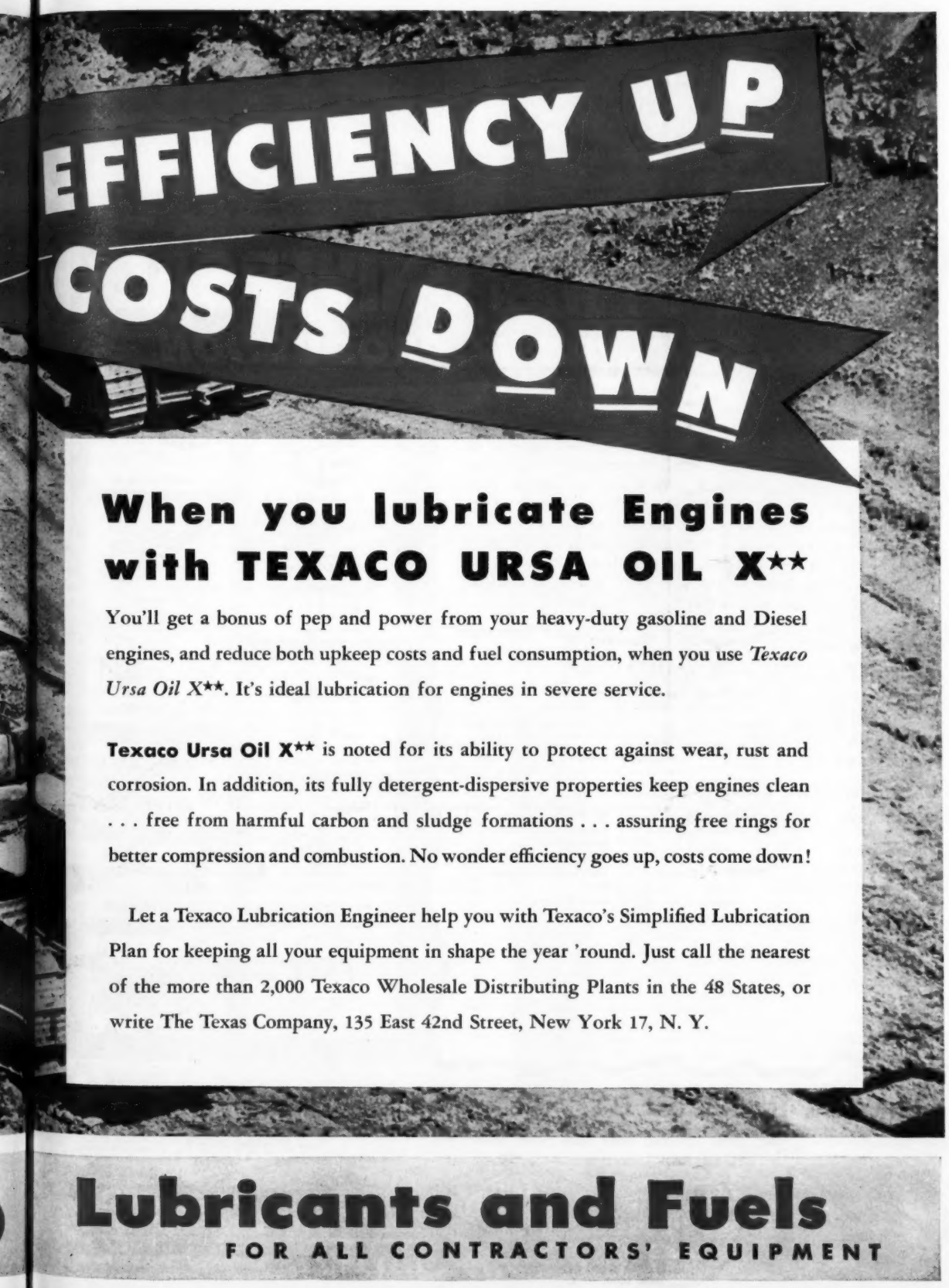
Further information may be secured from Goodrich. Or use the Request Card at page 16. Circle No. 80.

A Bituminous-Concrete And Aggregate Spreader

A 4-page folder on the Miller bituminous-concrete and aggregate spreader has been prepared by The Miller Spreader Corp., 120 Pike St., Youngstown 2, Ohio. Features highlighted in the folder are 90 per cent reduction in hand-labor costs, speedier work, a level course regardless of the base contour, and a maximum capacity of 1 ton per minute.

The Miller spreader will spread depths of ½ inch to 8 inches and is available in 7½, 8, 9, and 10-foot widths. A bleeder plate on each side of the machine permits a 6-inch extension in application. The catalog shows the spreader working on highways, driveways, parking lots, industrial flooring, etc. The unit may be attached to any standard dump truck with a set of Miller bolt-on truck hitches. Three sets of hitches are furnished.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 79.



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Mast-Mounted Drill Sinks Anchor Holes

Fort Randall Wall Anchors Are Drilled in High Rock Face By Special Drill Designed With Dam in Mind

By RAYMOND P. DAY
Western Editor

(*Photo on Page 1*)

✦ A NEW drill, mast-mounted to work from ground level to 55 feet high at the flick of a lever, has simplified the drilling of anchor holes high on the chalk walls of the stilling basin at Fort Randall Dam. The unusual rig was developed by McKinney Drilling Co., foundation contractor of Nacogdoches, Texas. Drilling was a subitem under a main Corps of Engineers contract with McCarthy Improvement Co., of Davenport, Iowa.

The drilling subcontract was extensive. It covered 525 wall anchor holes 6 inches in diameter and an average of 20.5 feet deep, with 12-inch underreamed bottom bells. Also included were 6,600 anchor holes 6 inches in diameter and 25.5 feet deep. Underreaming on these holes provided an 18-inch bell. These holes were placed beneath the primary and secondary stilling-basin slabs. All the holes were located on an average of 5-foot centers.

Drill Specially Built

The machine which drilled the wall anchor holes was custom-made, to McKinney ideas, by Hugh B. Williams Co. of Dallas, Texas. In the past, Williams manufactured many of McKinney's special foundation drills, including those which drilled and under-reamed the unique pier foundations on the Houston Expressway.

The rig consisted basically of a 55-foot mast, with a powered drill table which was raised and lowered by the cable from the power-control unit of a D7 Caterpillar tractor. The D7 also acted as a towing unit to move the rig.

Drill power on the table consisted of a 37-hp Buda engine, which drove the drill bit through reduction gears and a 3½-inch kelly bar. A hydraulic motor handled the kelly-bar crowd. The drill bit was a conventional 3-way drag type, hard-faced by Stellite or Victor tungsten carbide.

The drill platform was mounted on the tubular mast in such a way that it could travel 45 feet up and down. A touch of the power-control unit lever moved the platform wherever the driller wanted to go.

Corps of Engineers geologists had developed under-reamers and other devices to provide better anchorage by cutting spirals and rings in the walls of drill holes. However, this equipment was designed for test installation of anchors, not for large-scale contract work. McKinney had developed one for use at Harlan County Dam, at a cost of $1,400 per unit, and that too did not work very well. So veteran driller and Superintendent Harry Bell gathered up some ideas and theories, and built an under-reamer that caused Colonel Henry J. Hoeffer, District Engineer, to remark, "This goes to prove that when we've got specialized work to do we should hire specialists to do it."

C. & E. M. Photo
Superintendent Harry Bell inspects the under-reamer he built for McKinney.

Bell took a piece of ¾-inch boiler plate and cut two pieces of steel for the reaming wings. Teeth were cut in the wing sides, and these were later hard-faced. The wings were mounted on a drill stem by a bolted connection which passed through the stem slightly off center. The trick was the fact that the wings, when collapsed to the size of the hole, were not flat against the bottom of the hole. They were sloping.

Thus when crowd pressure was applied to the kelly bar, there was only one thing for the reaming wings to do, and that was to spread. It was a simple little idea, and like all good ideas that work, as easy as A-B-C. Yet it made possible what had promised to be a dif-

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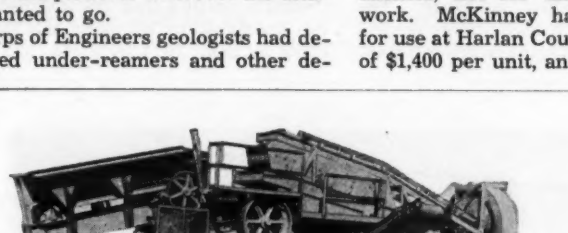

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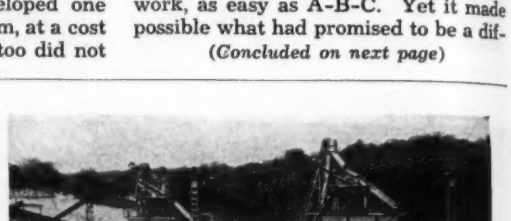

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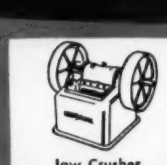
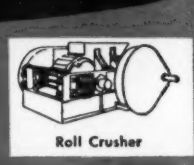
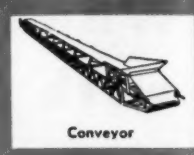
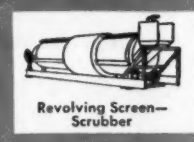

Jaw Crusher

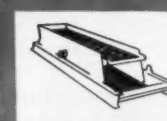

Roll Crusher

Hammermill


Conveyor

Apron Feeder


Revolving Screen—Scrubber


Gyrating Screen

Bucket Elevator

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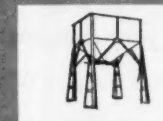
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C. & E. M. Photo
This simple device reduced reaming time 20 to 30 minutes.

ficult feat. The McKinney organization has applied for patent rights on the under-reamer.

Drills Line of Holes

The fall anchor holes were drilled into an almost vertical face, which had been outlined by a coal saw as excavation was done. Therefore so far as locating and starting the holes was concerned, conditions were nearly perfect.

A light measuring chain, marked at 5-foot points, was stretched from a survey point on the top berm to a corresponding survey point at the base of the wall. One marker was set on the bottom hole location, and this automatically spotted the remainder of the holes in that row up the face of the cliff.

The D7 backed the drill rig into position, and the drill went to work, finishing the entire row before moving away. As the bit tore into the chalk walls, a 500-cfm Chicago Pneumatic compressor furnished air to blow the cuttings out of the hole. The only drilling difficulty was the presence of iron pyrites and some quartz, which was exceptionally hard on drill bits when it was found.

With only a 3-man crew, Bell was able to drill and under-ream 20 finished holes per 10-hour shift.

Speed on Primary Holes

The best speed, however, was on the 6,600 anchor holes under the primary and secondary stilling basins. In only 86 days that big job was finished.

For about half of that work, the same drill rig which worked on the Houston Expressway was used. Mounted on a Mack truck, it had a 60-hp Continental engine for drill power, and a 3½-inch-square kelly.

The other half of this primary work was done by a standard 1500 Failing drill. Under-reaming was done by 24-inch spread reamers, and since drilling was all done vertically from the stilling-basin floor, little difficulty was encountered.

When this magazine visited the project, final arrangements for placement of the steel anchors and the grout which will hold them in place had not been completed. The prime contract for this work belongs to McCarthy and the prime contractor may not subcontract it.

McCarthy Improvement Co. has nearly $11,000,000 worth of work downstream from the dam axis, including the powerhouse substructure, tailrace, primary and secondary pools, and three training piers. This work is off to a good start under the direction of a noted superintendent of the old school, Project Manager E. E. Foot.

Many engineers believe that the satisfactory showing made on the anchor drilling played a considerable part in determining the final design of the enormous 600,000 second-foot spillway to be built by subsequent contract. The spillway stilling-basin walls will be similar in design to those now under construction in the outlet works area.

USBR Monographs Issued

The Bureau of Reclamation has brought out its fifth monograph in a series which records developments, innovations, and progress in the planning, construction, and operation of Reclamation structures and equipment. The new one covers Soap Lake Siphon, a 12,900-foot-long irrigation structure on the West Canal, part of the Columbia Basin Project in Washington.

The other monographs available are: No. 1, "Petrography and Engineering Properties of Igneous Rocks"; No. 2, "Multiple Correlation in Forecasting Seasonal Runoff"; No. 3, "Welded Steel Penstocks—Design and Construction"; No. 4, "Project Effect on South Platte River Pollution". These and No. 5 on Soap Lake Siphon may be obtained for 25 cents a copy from the Bureau of Reclamation, Denver Federal Center, Denver, Colo., or Washington, D. C.

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Take Roebling Preformed "Blue Center" Wire Rope with Independent Wire Rope Core!

No finer rope has ever been made, and its basis is "Blue Center" steel—an exclusive Roebling development. Its high resistance to abrasion, shock and fatigue spells long life . . . To this, Roebling *Preforming* brings the further advantages of new handling ease and improved performance . . . And the addition of I.W.R.C. assures top resistance to operating pressures and provides increased rope strength.

Roebling makes a wire rope of the right construction, grade and size for every type and make of rope-rigged equipment. Have your Roebling Field Man recommend the best rope for low-cost performance on each of your installations.

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A CENTURY OF CONFIDENCE
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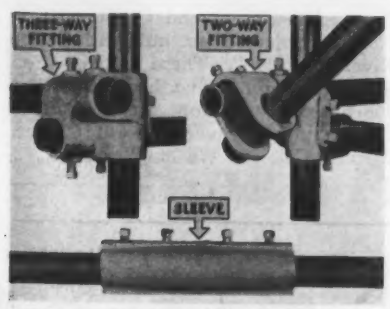
JOHN A. ROEBLING'S SONS COMPANY, TRENTON 2, NEW JERSEY



Here are the three fittings to go with the all-metal pipe-scaffolding system made by Amidon Sales Co.

Scaffolding System Uses Standard Pipe

A new system of all-metal scaffolding made up of standard pipe and patented fittings is announced by Amidon Sales Co., Box 61, Elyria, Ohio.

Amidon scaffolding consists entirely of standard 1-inch steel pipe fastened together by one or more of the following types of fittings: a three-way fitting, for connecting longitudinal, transverse, and vertical pipes into a single corner joint, and for attaching one or two diagonal braces; a two-way fitting, for fastening two pipes at right angles, as in attaching single diagonals, outboard brackets, guardrails, and ladder rungs (the two-way fittings also permit building the scaffold to fit around circular structures and bends of any angle); a sleeve, for joining lengths of pipe and for attaching casters.

With these three fittings and standard pipe, scaffolds are readily built to any length, depth, height, and shape required, the manufacturer says. Horizontals can be placed at any desired working level; and the verticals can be placed between obstructions such as trenches, abutments, and rows of seats. Standard casters are attached to the verticals to make rolling scaffolds.

These scaffolds may be erected on hillsides, stairs, or rough terrain as readily as on level ground, without using screw jacks or special footings; for the verticals are set wherever desired and the scaffold built up from there. Amidon explains that erection consists only of sliding the pipe into the fittings and tightening two set screws at each joint.

An illustrated bulletin giving further information may be secured from the company. Or use the Request Card at page 16. Circle No. 42.

Asbestos-Bonded Pipe

A 6-page folder describing the structural strength and material durability of asbestos-bonded pipe has been prepared by Armco Drainage & Metal Products, Inc., Middletown, Ohio. This folder, entitled "Here's the Drainage Structure With a 'One-Two' Punch", also describes how asbestos-bonded pipe is made. Photographs illustrate test installations and the use of these pipes for industrial sewers and culverts in marshy and salt-water conditions. The pipes come in sizes ranging from 8 to 96 inches with gages from No. 16 to No. 8. Standard lengths are available in multiples of 2 feet. Construction features of the pipe are described and illustrated.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 18.

Smith Personnel News

J. J. Bohmrich, former Manager of the Product Service Division of A. O. Smith Corp., Milwaukee, is now Group Executive for the Product Service, Railroad Products, and Welding Electrode and Equipment Divisions. J. W. Spoor, former Assistant Manager, replaces Mr. Bohmrich. E. R. Dickinson, who has been Manager of the Chicago branch, is being transferred to the eastern branch at Union, N. J., as Manager. He succeeds C. L. Tracey who moved to the New York district office. J. A. Snyder is now Manager of the Dallas branch; D. R. Neff, former Manager, has resigned.

Information on Drills For Wells or Blast Holes

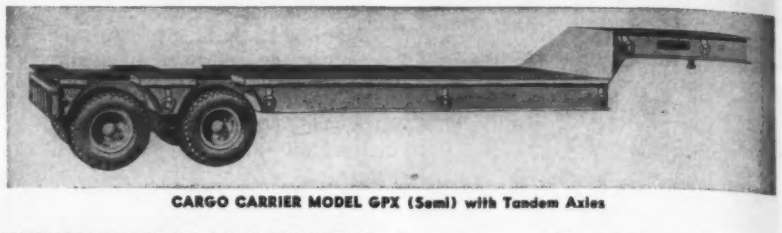
Literature on a line of truck and tractor-mounted well or blast-hole drills is available from the Keystone Driller Co., Beaver Falls, Pa. The Model 50 is designed to handle 2,000 pounds of tools to a depth of approximately 500 feet. The lighter Model 40 is designed to handle 1,600 pounds of tools to a depth of 500 feet.

Both the 40 and 50 Series may be truck-mounted or crawler-tractor-mounted depending upon the applications for which they are intended. The folders include complete specifications and detailed descriptions of the units.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 38.

SOLVE YOUR HAULING PROBLEMS WITH A "TRANSPORT TRAILER"

Capacities through 75 Ton—Semi and Full Trailers



CARGO CARRIER MODEL GPX (Semi) with Tandem Axles

PATENTED TANDEM AXLE ASSEMBLY—Featuring unusual lengthwise and sidewise wheel accommodation to irregularities in the road. Use of full width tubular, forged, heat treated axles with CAMBER.

FRAME—Constructed of beam sections throughout, electric welded. A ruggedly strong and efficient unit with minimum weight.

TRANSPORT TRAILERS, INC.

TRANSPORTATION ENGINEERING A SPECIALTY

CEDAR RAPIDS, IOWA, U.S.A.

How to keep a batch of concrete from becoming a batch of trouble

Even a minor breakdown can cost you hundreds of dollars when you're hauling ready-mix concrete.

But the owner of the truck above isn't worried. He has an International working for him. He knows he can depend on an International to stay on the job even in the toughest going.

Heavy-duty engineered stamina

Every International Truck is heavy-duty engineered to stand up under punishment.

This means that extra strength and toughness are built into every truck part. You get the maximum in trouble-free operation and the long life that have kept Internationals first in heavy-duty truck sales for 18 straight years.

. . . Plus a new world of comfort

No wonder the new Comfo-Vision Cab offers so much comfort—drivers themselves helped design it. You get more head room, leg room, and foot room in the "roomiest cab on the road." You get full front visibility through a one-piece, curved Sweepsight windshield. You get an easily adjustable seat packed with comfort.

And just wait until you take the wheel. New Super-steering and Super-maneuverability give you more positive control from a more comfortable position and enable you to turn in shortest practical circles.

Get the full story NOW

The world's most complete line of trucks offers you exactly the right model for your job. Ask your nearest International Truck Dealer or Branch for complete information.

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McCormick Farm Equipment and Farmall Tractors
Motor Trucks . . . Industrial Power
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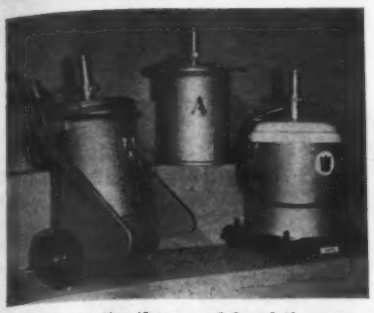
INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY CHICAGO



Above are the three models of the new Alemite 711 air-operated high-pressure lubricator. The factory-sealed power head is guaranteed for 27 months; the pump handles lubricant from 25, 35, or 50-pound original containers.

Three New Lube Pumps

Three models of an air-operated high-pressure lubricant pump, the Alemite 711, which will deliver lubricant from 25, 35, or 50-pound original containers, have been announced by the Alemite Division of Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Ill.

The heart of the 711 pumps is a new sealed-in air motor, unconditionally guaranteed for 27 months. The pump has a minimum of moving parts and weighs 9 pounds. The motor is said to require no oiling and has an exclusive centered-valve design, with the air valve and related parts located between the air cylinder and pump tube. The motor will not stall, according to Alemite engineers. The pump tube is equipped with the Alemite dynamic primer and does not require bleeding to eliminate air pockets.

Model 711 is mounted on a black baked-enamel base with 3-inch casters and a pull-handle. It is 31¾ inches high. Lubricant pails are changed by loosening two set-screws at the base of the shield and lifting the shield, pump, and hose assembly as a unit. The lubricant container is then set into a recess in the base, in which it is automatically centered, and the shield and pump and hose are replaced.

Model 711-A is mounted in a pivot-swing dolly instead of a castered base. It has 8-inch ball-bearing wheels with semipneumatic tires and a bicycle-grip pulling handle. Instead of a shield, it has a lubricant container into which 25, 35, or 50-pound original pails can be placed, or which, if used as the lubricant reservoir, can hold 70 pounds of lubricant transferred from a larger original container. The cover, which supports the pump, has three clamps and a sealing ring and gives full-open head for filling or for changing of pails. It has a dirt-tight seal when closed. It can be pulled over unpaved areas, over rough or uneven floors, or up and down steps. Model 711-B is a stationary unit without base or dolly. It has the same 70-pound capacity lubricant reservoir used on Model 711-A.

All three units are finished in oven-baked enamel and simulated hammered aluminum. Each has a hose assembly consisting of a Z-type swivel, 6 feet of high-pressure hose tested to 20,000-pound pressure, and a control valve with a single-shot or continuous-flow adjustment. According to the manufacturer, the pump has positive 40 to 1 ratio and delivers 14½ ounces of chassis lubricant per minute at 70 degrees F with 150 pounds of air pressure.

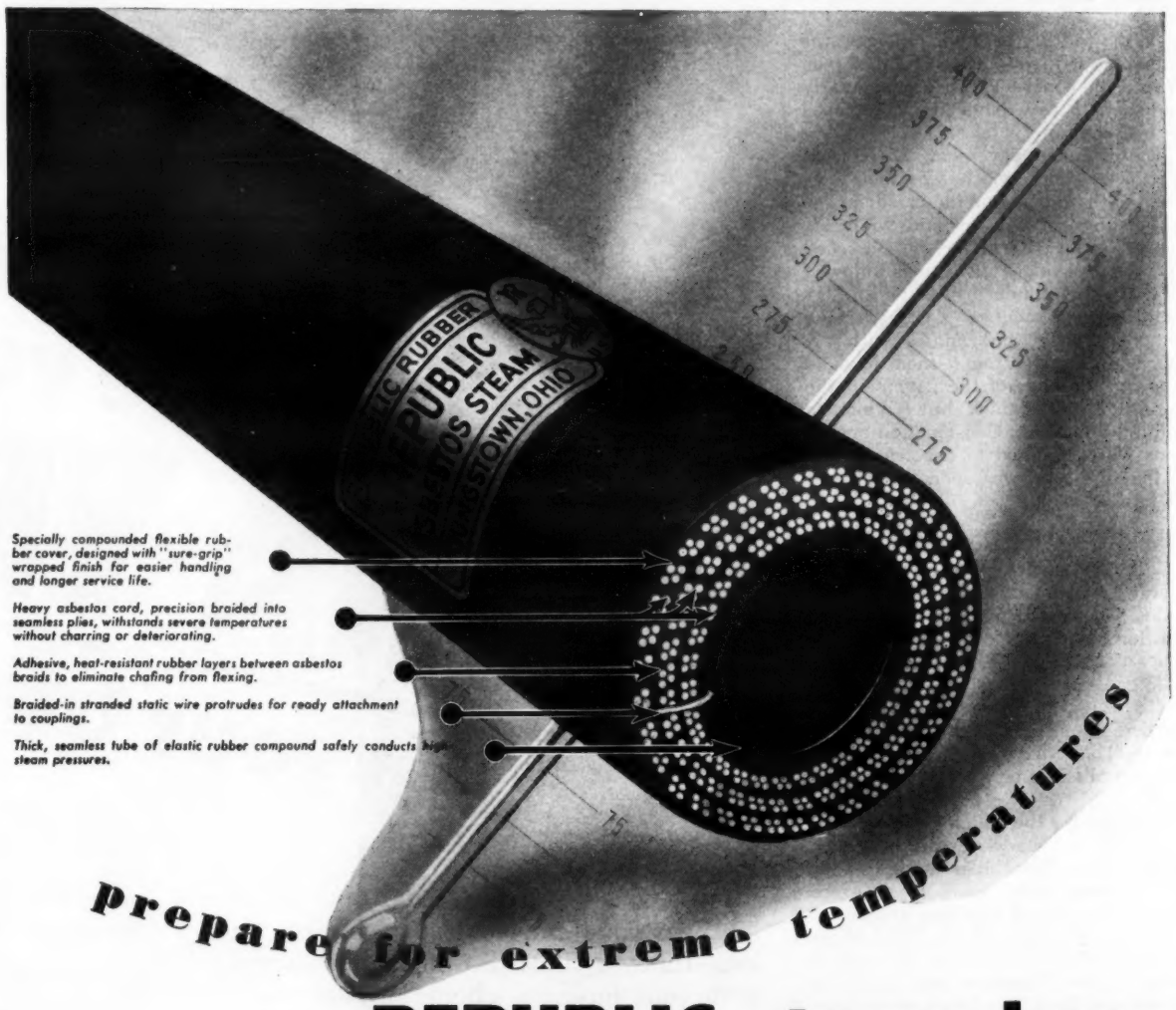
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 24.

Catalog on Hard-Facing

A new hard-facing catalog has been announced by Air Reduction Sales Co., a Division of Air Reduction Co., Inc., 60 E. 42nd St., New York 17, N. Y. It contains detailed information on the complete Airco line of hard-facing alloys, including typical uses, mechanical properties, chemical analyses, and recommended procedures. It also tabulates recommended grinding wheels for dressing deposits of Airco hard-facing alloys.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 104.

Levee construction along the Missouri River basin near Rockport, Mo.—J. D. Armstrong Co. of Ames, Iowa, the contractor. International tractors pull sheepsfoot rollers and scrapers, serve as pushers, and brandish dozers. Armstrong preaches and practices train-loading operation of tractors and scrapers to boost production.


400
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300
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Specially compounded flexible rubber cover, designed with "sure-grip" wrapped finish for easier handling and longer service life.
Heavy asbestos cord, precision braided into seamless plies, withstands severe temperatures without charring or deteriorating.
Adhesive, heat-resistant rubber layers between asbestos braids to eliminate chafing from flexing.
Braided-in stranded static wire protrudes for ready attachment to couplings.
Thick, seamless tube of elastic rubber compound safely conducts high steam pressures.

prepare for extreme temperatures

REPUBLIC steam hose

● Republic's braided Asbestos Steam Hose carries high pressure steam with safety and economy.

It's made to handle pressure up to 200 pounds without charring and for use on all jobs where continuous service and dependability are important to success.

Republic Asbestos Steam Hose has seamless rubber steam channels, surrounded by multiple plies of precision-braided asbestos cord.

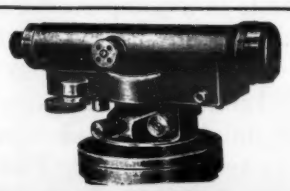
Thick layers of specially compounded insulating rubber protect each ply against internal chafing.

Republic Asbestos Steam Hose is built with tough, flexible outside covers that resist abrasion. The special "sure-grip" cover design makes the hose easy to handle; less dangerous underfoot.

Contact your local Republic Distributor or write direct for more information about this super-duty steam carrier.

Asbestos Steam Hose is available in standard fifty-foot lengths, ready to go to work on your toughest job. And, don't forget the many other products and services available at Republic Rubber, for nearly a half century, the specialist in the field of industrial rubber.

INDUSTRIAL RUBBER PRODUCTS BY
REPUBLIC RUBBER DIVISION
Lee Rubber & Tire Corporation
YOUNGSTOWN, OHIO



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ERECTING EYEPIECE

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With Double Bubble

Accuracy Low Cost Work Fast Work
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Terms Arranged

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478 Water Street, New York 2, N.Y.

Concrete Widening, Blacktop Surfacing

Illinois Highway Is Improved Under a 20½-Mile Contract; 2½-Ton-Pugmill Asphalt Plant Set Up for Job

✦ LAST year the Illinois Division of Highways reconstructed a 20½-mile section of State Route 159 from Belleville south to Red Bud in the East St. Louis District 8. A contract for the widening and surfacing improvement was awarded to Payne & Dolan, Inc., of Chicago, Ill., on its low bid of $864,498. Work got under way the end of August and was finished in November.

Built 25 years ago of plain concrete, the 18-foot pavement was cracked and broken, and was too narrow for the present heavy traffic. Widening consisted of adding to each side a strip of concrete base, 8 inches thick and 2 feet in width. Through villages the widening strip was increased to 3 feet. Where the concrete was in particularly bad shape it was removed and replaced with a concrete patch.

The widened pavement, 22 feet, 24 feet, or variable width, was then covered with I-11 bituminous surfacing. A leveling course was laid wherever depressions of 1 inch or more existed in the old pavement. This was followed by a 1½-inch binder course and a 1½-inch surface course. Crushed-stone shoulders were then added, with the aggregate graded from 1 inch down to dust. At the edge of the pavement the stone is 3 inches thick, but feathers to nothing 3 feet out. Construction operations were confined to one traffic lane so that the road was open to traffic at all times.

Widening Operations

Concrete widening and patching operations were done by M. Hoeffken & Co., a Belleville contractor. Patching was done by cutting out the undesirable areas of concrete with an RPB paving breaker, and loading the rubble into trucks with a Dempster Dumpster. Farmers along the way made use of the spoil. Transit mixers from Belleville supplied concrete for the patchwork.

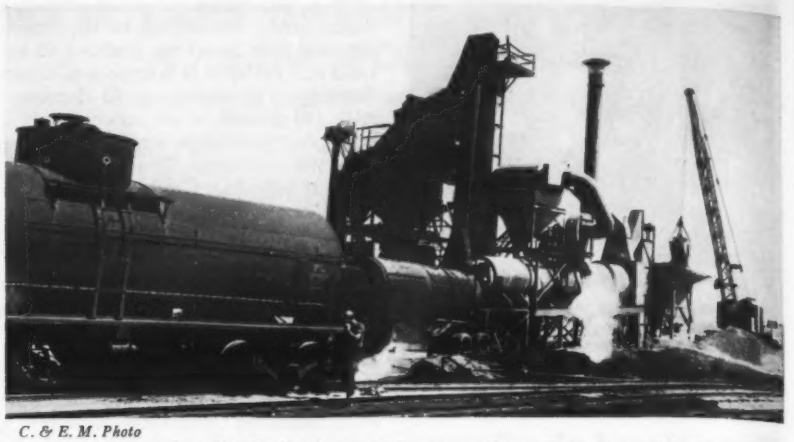
Trenches for the widening operations were cut out by a Buckeye trench grader and a Caterpillar motor grader with a drop blade. Road forms were set, and the trench was fine-graded by a planer pulled by a truck. The bottom was compacted by a Buffalo-Springfield trench roller. Concrete was mixed in a Koehring 34-E Twinbatch paver with water being supplied from an accompanying Autocar 5,000-gallon tank truck. Trucks supplied the proportioned cement and aggregates from a batch plant in Belleville.

The boom was removed from the paver so that the concrete was discharged directly into a 12-foot-long "mule" pulled along by the paver. This was simply a carriage holding a chute for discharging the concrete into the trench. As the concrete was deposited, it was vibrated, then struck off with a screed, and finished by hand. Paper was spread on for curing. The widening strips were open to traffic in a week's time.

Asphalt Plant

In the meantime a Hetherington & Berner asphalt plant with a 2½-ton pugmill was set up near Red Bud at the south end of the job on a siding of the Gulf, Mobile & Ohio Railroad. The plant and equipment, owned by the Mid American Engineering Corp., was leased to the general contractor of the project.

Sand for the mix was trucked to the job 26 miles from a pit near Chester, Ill. This sand, rather coarse in texture, was all right for the binder course, but some finer sand, obtained locally, was blended with the coarse sand for use in the surface mix. Crushed limestone, for the coarse aggregate, was shipped to the plant siding from the Columbia Quarries at Krause, Ill. It was emptied out of hopper-bottom cars into a concrete pit built under the siding track. The stone cars were shifted by gravity on the slight grade over the pit.



C. & E. M. Photo

Payne & Dolan set up this Hetherington & Berner asphalt plant with a 2½-ton pugmill at the south end of the widening and surfacing job on Illinois State Route 159.

Limestone dust for mineral filler in the surface course came from the stone quarry also, but was delivered to the plant by truck. It was dumped into a 500-pound storage bin and raised to the plant tower by worm gear and elevator.

PA-1 asphalt, with penetration 70-

(*Continued on next page*)

Now's the time to make sure you get EXTRA YEARS in your trucks!

THE trucks you buy today may be the ones you'll have to live with for a long, long time to come. So don't take chances with your business—choose a truck with a reputation for long life and trouble-free service—a truck-built GMC.

Just compare a GMC in the size and type you need with any other make. Or ask a trucker who is using GMC's—and you'll both see and hear why a GMC gives extra years of service.

They're real trucks!

Note the rugged GMC engines, both gasoline and Diesel. These sturdy truck-built power plants seldom require replacements—and they keep on the go with minimum shop time.

You'll find great strength built into GMC frames without costly dead weight. You'll find long life features like Synchro-Mesh transmission, hypoid differential gears, longer springs and full ball-bearing steering are standard on many models.

But most important of all—every GMC is a *real truck,* built by the world's largest exclusive manufacturer of commercial vehicles. They're engineered for extra years of truck work.

Most complete line of trucks in the world

GMC trucks are made in a complete range of light, medium and heavy-duty models, with ratings all the way from 4,600 lbs. GVW to 90,000 lbs. GCW and come in the industry's widest variety of engine-body-chassis combinations to fit every trucking need. *There is a GMC specially designed for your job!*

* * *

Be sure your next truck has the longer life, greater durability, and better performance that you can get in a GMC. Let your GMC dealer give you details—see him soon.

GMC Truck & Coach Division of General Motors

85, used in the mix was obtained both from the Berry Asphalt Co. at Waterloo, Ark., and from the Co-op Refining Association at Coffeyville, Kans. It was pumped from the tank cars at the siding by a Viking 3-inch asphalt pump, either directly into the plant or into two 10,000-gallon storage tanks. Steam for heating the bitumen was generated in a Marion 200-hp horizontal oil-burning boiler. An 11,000-gallon tank at the plant held fuel oil, furnished by the Shell Oil Co. from Wood River, Ill.

The Operations

The aggregate from the stockpiles was loaded into a three-compartment receiving hopper bin by a Lorain truck crane with a 50-foot boom and an Owen ¾-yard clamshell bucket. A Lorain 75 crawler crane with a 50-foot boom and an Owen 1-yard clamshell was on hand as a standby. From the bottom of the hopper, a feeder moved the two sizes of sand and the stone to a 26-foot cold elevator that led to a dryer—30 feet long x 6 feet in diameter. It was heated at the discharge end by two Hauck burners. An 80-inch exhaust fan pulled the fine material to a dust collector whence it dropped down to the foot of the hot elevator. Smoke and fumes passed off through a high stack.

C. & E. M. Photo
A Galion 10-ton tandem, an Austin-Western 11-ton 3-wheeler, and a Huber 10-ton tandem compact hot-mix on Illinois State Route 159.

At the top of the 52-foot hot elevator, the heated aggregate spilled over a Deister 4 x 10-foot four-decker screen that was used for both binder and top courses. The screen sizes were: 1⅛-inch, 9/16-inch, ¼-inch, and No. 6. Below the screens the material was caught in a bin divided into four compartments, each with a 12½-ton capacity. The asphalt also came in at this level through a 3-inch jacketed line to a weigh bucket with a 500-pound capacity. A 5,000-pound batch was weighed out on Kron dial scales and mixed for 45 seconds in the pugmill, and then discharged into trucks that had backed under the mixing tower.

A General Motors 125-kw diesel generating set supplied the necessary power to run the 11 electric motors that operated the plant. The various motors with their horsepower ratings follow: feeder—5; cold elevator—10; dryer—50; pugmill mixer—75; worm gear—3; dust elevator—5; fuel oil—2; screens—7½; hot elevator—15; asphalt pump—7½; and boiler—2.

Water for the plant was piped in from the town of Red Bud. The plant was in operation 12 hours a day for 6 days a week. Over the week ends the boiler was run on a small E-M gas-electric 10-kw ac generating set. It was operated by a crew of 11.

The Mix

The weights of typical 5,000-pound batches of binder and surface material were as follows:

	Binder	Surface
1-inch stone	2,005 lbs.	....
½-inch stone	1,150 lbs.	2,250 lbs.
¼-inch stone	250 lbs.	600 lbs.
Sand	1,350 lbs.	1,650 lbs.
Mineral filler	....	210 lbs.
Bitumen	245 lbs. (4.9%)	290 lbs. (5.8%)
Total	5,000 lbs.	5,000 lbs.

The gradation specifications for binder and surface courses were:

Passing	Retained	Binder	Surface
1-inch	....	95-100	....
1-inch	½-inch	25-45	....
½-inch	....	....	95-100
½-inch	No. 10	25-45	45-65
No. 10	....	20-35	....
No. 10	No. 40	....	5-15
No. 40	No. 80	....	7-22
No. 80	No. 200	....	4-13
No. 200	....	....	4-8
Bitumen	....	4-7 per cent	5-7 per cent

Of the mineral filler, 100 per cent passed the No. 30 sieve and from 75 to 100 per cent passed the No. 200 sieve.

On the Road

Before any blacktopping was done, the road was first swept clean with a Hough power broom, and then primed with RC-O asphalt at the rate of 0.075 gallon to the square yard. It was applied from an Etnyre 1,200-gallon distributor mounted on a White truck, and not more than 7 days in advance of the laying of the binder course. Half width was done at a time. The bitumen was covered with from 2 to 4 pounds per square yard of sand, put on with a limestone spreader so as not to "pick up". The leveling course was put down where necessary, and was followed by the binder and surface courses.

(Concluded on next page)

GMC
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GASOLINE & DIESEL TRUCKS
FROM ½ TO 20 TONS
GM
GENERAL MOTORS
WELL-WHEELED . . . FOR ANY GROUND
Contractors find this GMC 620 Medium-Weight Six-Wheeler unbeatable on the job and on the road. The four dual driving rear wheels move this truck up ramps, into excavations, over soft and rough earth, and through other conditions that stop ordinary trucks. Yet, on the road, it handles as easily as a 4-wheel truck. GMC 620 has GVW of 32,000 lbs., or 50,000 lbs. GCW when used with a trailer. Powered with 155 H.P. valve-in-head gas engine—with option of 177 H.P. at extra cost; wheelbase range from 153 to 219.
Your key to greater hauling profits
Get a real truck!

Concrete Widening, Blacktop Surfacing

(Continued from preceding page)

Material was hauled from the plant by Dan Raymond, a Chicago hauling contractor, who used International trucks carrying from 12½ to 15 tons per load. The number varied from three when working near the plant, to twelve when the full 20½-mile haul was required. The plant-mix was laid by a Barber-Greene Finisher in 11-foot lanes on the 22-foot pavement. The usual procedure was to run on one lane for a day, then bring the machine back and do the adjoining lane on the following day. Because of the swift pace of production, 90 tons an hour, three rollers were used to compact the material. From the finisher back these were: a Galion 10-ton tandem, an Austin-Western 11-ton 3-wheeler, and a Huber 10-ton tandem roller.

The binder and surface courses were each 1½ inches thick, with the binder weighing about 170 pounds and the surface 165 pounds to the square yard. The binder was laid around 275 degrees F, and the surface at about 300 degrees F.

The paving crew consisted of 4 operators—1 on the finisher and 3 on the rollers; a truck driver for the service truck; 2 rakers; 4 laborers; and 3 others engaged in sweeping.

Quantities and Personnel

The major items included:

Earth excavation	10,487 cu. yds.
Pavement removal and replacement	18,271 cu. yds.
Concrete base course, 8-inch	47,220 sq. yds.
Bituminous-material prime coat	20,330 gals.
Leveling course, bituminous concrete	1,204 tons
Binder course, bituminous concrete	22,998 tons
Surface course, bituminous concrete	22,309 tons
Crushed-stone shoulders	7,736 tons

For the contractor, Frank K. Murphy was General Superintendent, Terry Teel was Plant Foreman, and Carl Hibnar was Paving Foreman. For the Illinois Division of Highways, H. A. Herold was Resident Engineer, assisted by Harvey Hoffman, Assistant Resident Engineer, and Glenn Bertram, Proportioning Engineer. The Division is headed by C. M. Hathaway, Chief Highway Engineer. R. H. Tittle is Engineer of Construction, and F. H. Hefner is District Engineer of District 8 with headquarters at East St. Louis, Ill.

Two Power Sources For Stud Welding

Two special power units for Nelson stud-welding equipment have been announced by Nelson Stud Welding Division, Morton Gregory Corp., Lorain, Ohio. One is a motor-operated generator set which can be used to weld studs up to and including ⅝ inch in diameter. The other is a battery-operated unit which can be used for installing studs up to ½ inch in diameter.

The new power unit is said to be superior to a 600-amp generator, and in stud-welding performance to be equivalent to two conventional 400-amp generators in parallel. It weighs approximately 800 pounds and uses either 220 or 440-volt 60-cycle alternating current.

The battery unit provides a reliable source of power for stud welding wherever the voltages required for the operation of generators are not available. It requires a 110-volt ac outlet and it consists of twelve 6-volt 150-amp wet storage batteries securely mounted on a strong frame and covered with a hood. Wheels are optional. An automatic battery-charging device is mounted on top of the hood. The unit weighs approximately 1,100 pounds and can be moved on a trailer or pickup truck.

Further information may be secured from the company. Or use the Request Card which is bound in at page 16. Circle No. 85.

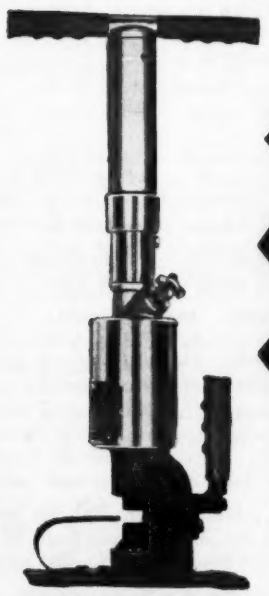
The new battery-operated power source shown in the foreground was developed by Morton Gregory Corp. to provide a reliable power source for stud welding. It is charged by plugging into any 110-volt ac outlet. Here workers are stud-welding fasteners to window lintels.

Cement Plant in Mississippi

To increase the availability of cement in the Mississippi area, Marquette Cement Mfg. Co. of Chicago, Ill., will build a new cement-producing plant at Brandon, Miss., 12 miles east of Jackson. It is expected to be completed about September 1 next year, and will produce a yearly total of 1,000,000 barrels of all types of portland cement as well as oil-well and masonry cement. A branch office of the Marquette sales department will be established in Jackson about July 1 next year.

Marquette will also build a dock at Vicksburg, Miss., with facilities for transfer of cement from railroad cars to barges on the Mississippi River.

ON-THE-JOB
CUTTING OF REINFORCING ROD
Made Easy!



Model 20-A Integral Hand Pump

PORTABLE, HYDRAULIC
CUTS ¾" REINFORCING ROD
CUTS 1" LOG CHAIN
WEIGHS ONLY 45 LBS.

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200 CUTS PER HOUR
Press pedal for automatic cutting. Air hydraulic pump assembly operates off any source of compressed air supplying 100 lbs. pressure. Uses 16 cubic feet per minute.

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ADAPTER
MULTIPLE COUPLING

The Greenbilt Type 6005 outlet box provides five interruption-proof outlets from one inlet.

Waterproof Outlet For Power Service

A new lightweight outlet box providing five interruption-proof outlets from one inlet has been announced by The Equipment & Service Co., 6815 Oriole Drive, Dallas 9, Texas.

When used with accessory connector Types 106 and 115, the Greenbilt Type 6005 outlet box gives the user dependable waterproof, weatherproof, and pull-out-proof power connections, the manufacturer says. The inlet connector Type 106 is rated for 6,000 watts and the outlet connector Type 115 is rated for 1,500 watts.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 113.

Half-Track Tractor Goes Over Snow, Mud

A new all-steel track mounts on Ford wheel tractors to enable easy movement over snow and muddy ground. Developed by the Arps Corp., New Holstein, Wis., the complete device includes a track unit and an idler unit. The track provides a 13 or 16-inch width and a 52, 56, or 60-inch track tread.

The Blackhawk Half-Track is said to be easy to mount or remove from the rear of the tractor. The track shoe is the pressed-steel grouser type with a 1-inch grouser height. The idler unit consists of 5.00 x 15 pneumatic tires with Timken tapered roller bearings, and supporting frame.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 101.

Shielded-Arc Welding

A broadside describing the features of Manual Lincolnweld has been prepared by The Lincoln Electric Co., Cleveland 1, Ohio. Manual Lincolnweld, a shielded-arc welding process, is accomplished with a lightweight welding gun that feeds both electrode and granular flux automatically. This, the folder says, makes it practical to apply the features of "hidden arc" welding to all types of welds in the flat or near-flat position.

The literature claims that the Manual Lincolnweld cuts welding cost, increases welding speed, and reduces the need for joint preparation. The equipment used is completely described; so is the welding procedure.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 64.

Cummins Appoints, Builds

Two assistant regional managers have been appointed by the Cummins Engine Co., Inc., Columbus, Ind. They are Burton C. Sears for the southeastern region, with headquarters in Atlanta, Ga., and Edward Daley for the southwestern territory, headquarters in Los Angeles. Mr. Burton has been a sales engineer for Cummins and Mr. Daley was previously a district manager for Marion Power & Shovel Co.

Cummins also announces that it is erecting a new building in Columbus to provide storage space for all materials and supplies and to house quality-control and inspection activities as well as a shipping department.

Handbook on Dewatering

A new pocket-size reference text for contractors, engineers, and others concerned with ground-water problems in construction work has been released by Griffin Wellpoint Corp., 881 E. 141st St., New York 54, N. Y. "The Wellpoint System in Principle and Practice" consists of seven chapters treating the history of wellpoint systems, principles of dewatering soils with wellpoints, components of a wellpoint system, planning the wellpoint-system layout, installing the wellpoint system, operating it, and removing it.

The 102-page book is illustrated with 38 line drawings and over 30 photographs. Its price is $1.50. However, free copies are available to contractors and practicing engineers concerned with ground-water problems in construction work.

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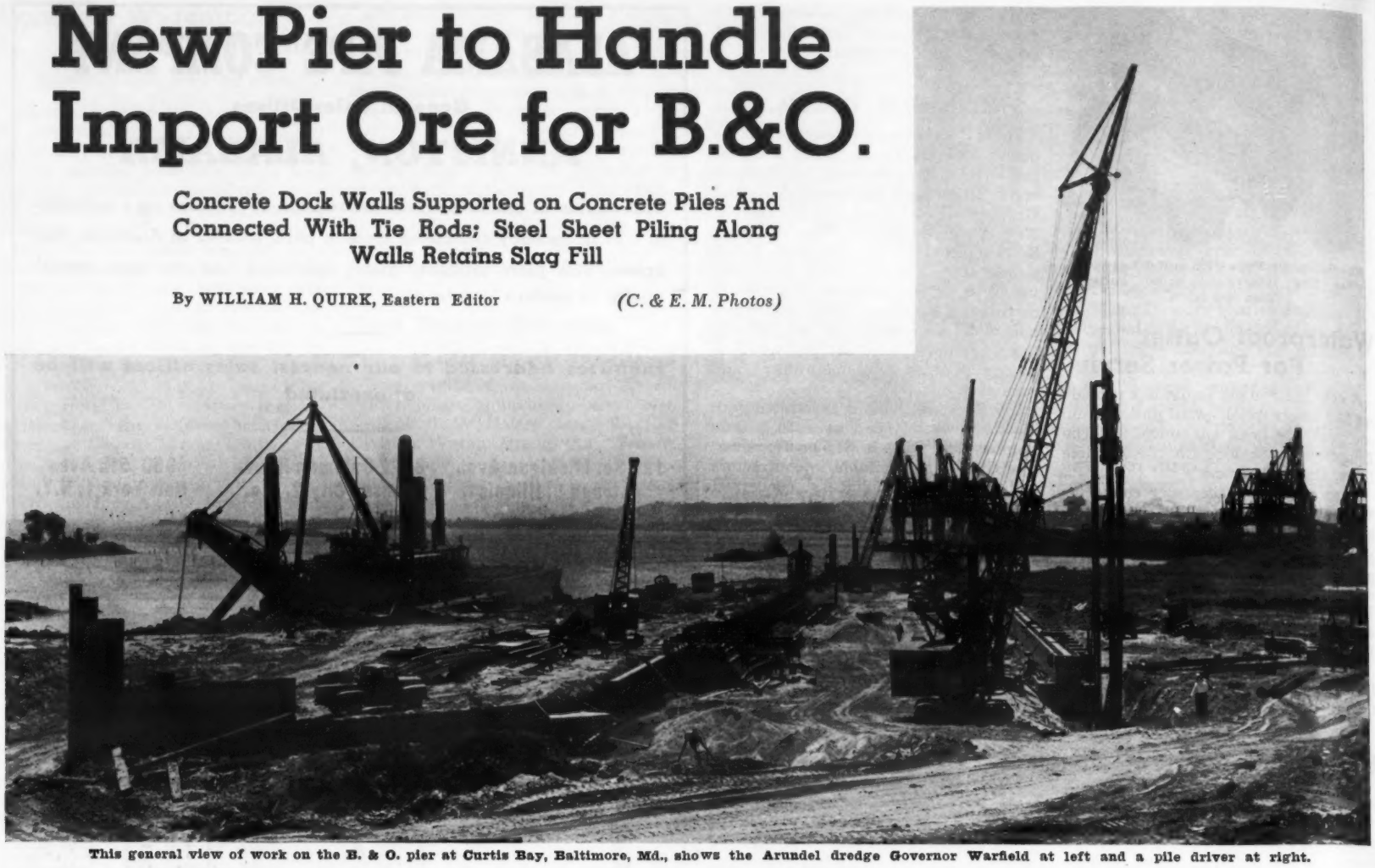
New Pier to Handle Import Ore for B.&O.

Concrete Dock Walls Supported on Concrete Piles And Connected With Tie Rods; Steel Sheet Piling Along Walls Retains Slag Fill

By WILLIAM H. QUIRK, Eastern Editor *(C. & E. M. Photos)*



This general view of work on the B. & O. pier at Curtis Bay, Baltimore, Md., shows the Arundel dredge Governor Warfield at left and a pile driver at right.

✦ TO handle large incoming shipments of bulk ore, the Baltimore & Ohio Railroad is constructing a new modern pier at Curtis Bay, Baltimore, Md. Construction on the $5,000,000 project started in March of this year, and is scheduled for completion early in 1951. It marks the first facility of its kind to be built by any railroad on the eastern seaboard. The pier will receive bulk ores such as iron, manganese, and chrome, and has berthing space to accommodate the largest ore-carrying ships now in existence or in the design stage—up to 45,000 tons.

The 650-foot-long x 80-foot-wide pier bordering the bay consists of two reinforced-concrete dock walls connected by tie rods on 6-foot centers. Between the parallel walls is a granulated-slag fill. The north and south runway walls are supported on cast-in-place concrete piles, while sheet-piling tieback walls at both ends are anchored to concrete walls on treated-timber piles. Steel sheet piling is driven along the front of the pier and the side facing the bay, and is continued for 80 feet down the south walls. Another 160-foot section extends along the shore on a 45-degree angle out from the north wall, at the land end of the pier.

Seven Contracts

Construction of the pier has been divided into seven major contracts. The Empire Construction Co. of Baltimore, Md., is building the pier itself, while the Arundel Corp. of Baltimore is dredging the channel adjacent to the pier. The manufacture and installation of two ore-handling machines and a belt-conveyor system is being done by the Dravo Corp. of Pittsburgh. The necessary steel superstructure will be fabricated and erected by the American Bridge Co., under a subcontract with Dravo Corp.

The service building and substation are being constructed by Lacchi Construction Co. and the maintenance building by the railroad forces. Electric car pushers and substation equipment are being supplied by General Electric Co. The wiring of service building and substation, together with the placing of substation equipment, is being done by the Blumenthal-Kahn Electric Co. The electrical conduit system is being installed by W. F. Wilson & Sons, Inc.

The location of the new facilities is particularly advantageous in its proximity to the B. & O. Curtis Bay coal pier and its supporting yards. Here the daily unloading of coal makes available a large number of empty cars for quick switching to the adjacent ore facility for loading and assembly into solid ore trains for movement directly to steel plants in Ohio and Pennsylvania. These trains will by-pass the heavy inter-

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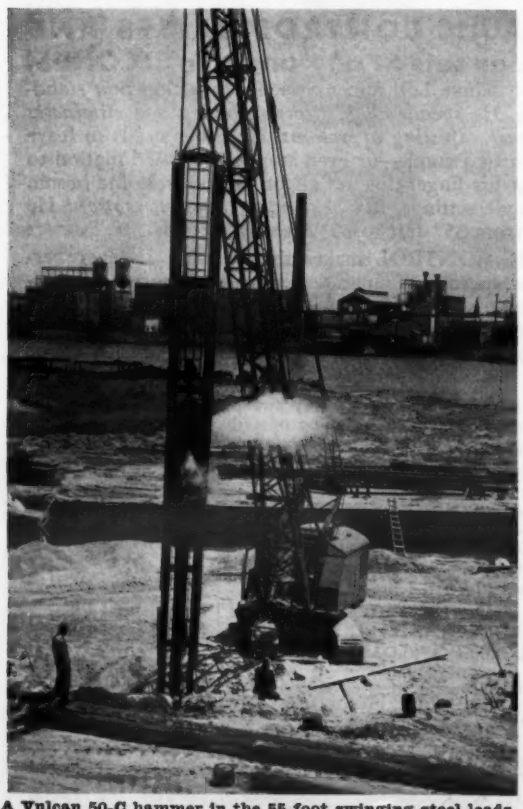
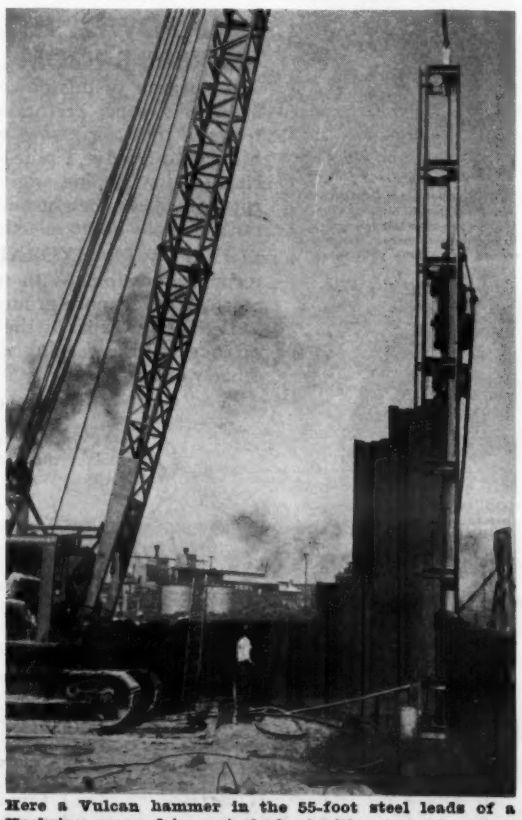
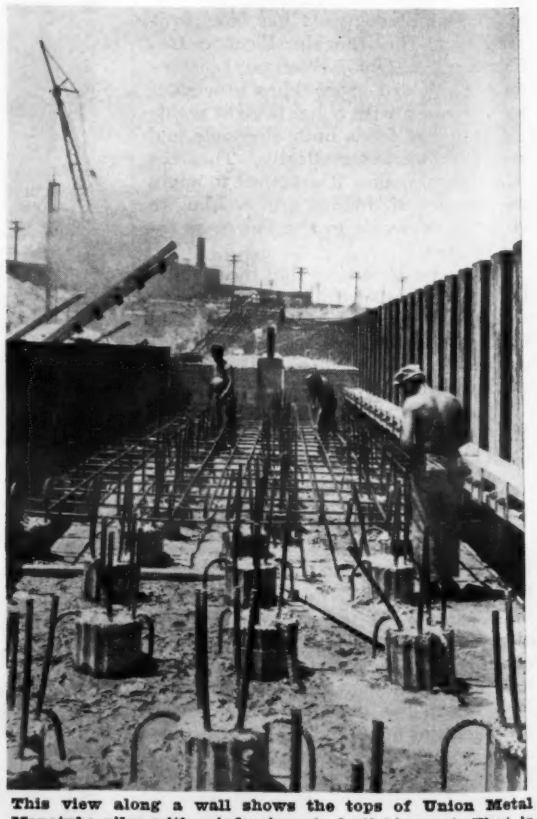


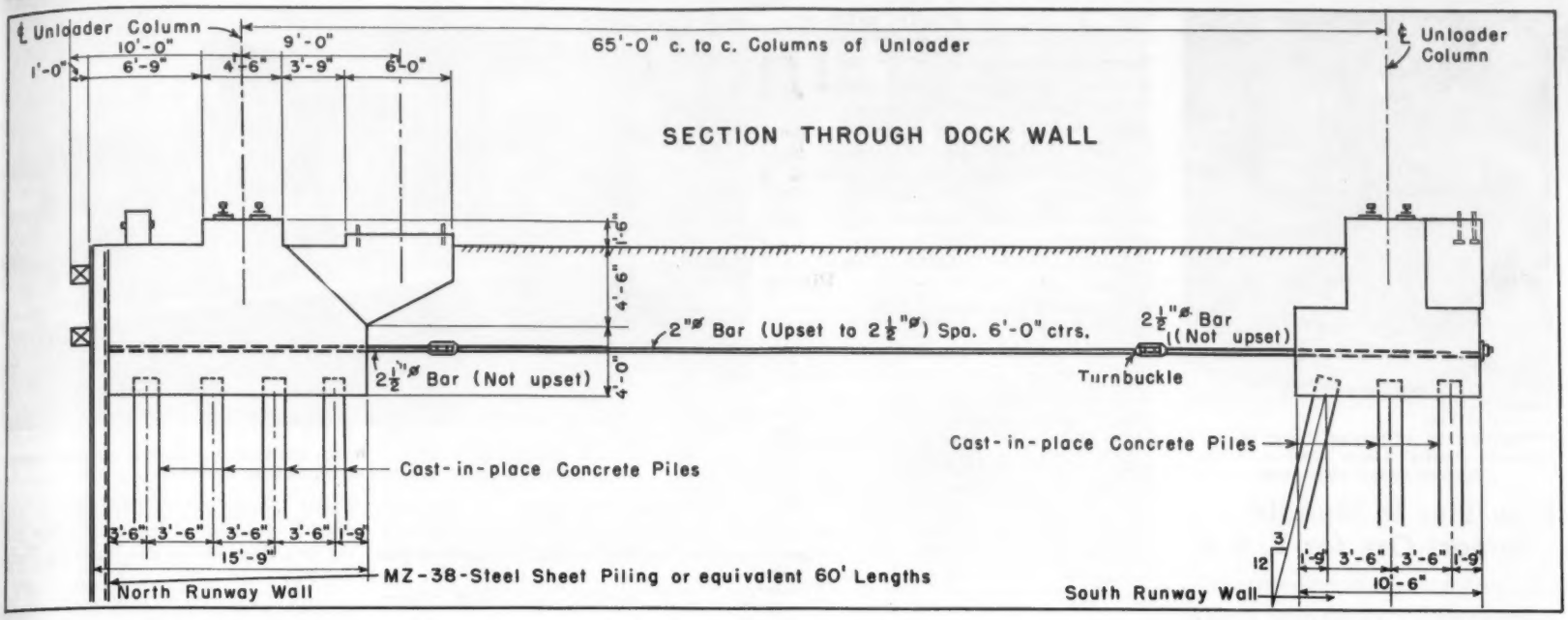
A Vulcan 50-C hammer in the 55-foot swinging steel leads of a Northwest crane with an 80-foot boom drives a batter timber pile for a pier tieback wall.



Here a Vulcan hammer in the 55-foot steel leads of a Koehring crane drives steel sheet piling two at a time at the outside end of the pier.



This view along a wall shows the tops of Union Metal Monotube piles with reinforcing steel sticking out. That is sheet piling at right and a finished wall section at rear.



freight and passenger-train movements in the Baltimore area. Thus the location has the advantage of providing coordination between export-coal and import-ore movements, with maximum efficiency in the use of railroad cars and terminal facilities.

Before any work on the pier proper started, the low and swampy site was drained. Along the bay front the land was a combination of hydraulic fill, river silt, sand, and gravel, with pockets of muck interspersed over the area. Farther back from shore, where the ground rises sharply, firmer and more stable soils were encountered.

Grading at the Site

Unsuitable material was removed over the entire job site, with the excavation in spots going down to minus 2 elevation mean sea level. About 10,000 cubic yards of muck was dug out and spoiled as waste. The total grading, involving about 190,000 cubic yards, was handled under a subcontract by Victor A. Pyles of Baltimore, employing 1¾ and 1-yard shovels loading out to a fleet of 22 dump trucks. Filling material was obtained from borrow pits landward of the pier, with granulated slag being used to fill the pier area.

The Duquesne Slag Products Co. of Pittsburgh supplied 30,000 tons of granulated slag which was delivered in hopper-bottom cars to sidings adjoining the site. A Barber-Greene unloader emptied the cars, transferring the slag to four Koehring Dumptors of 5-yard capacity. Two Caterpillar 10-yard DW10 wagons were also used in slag haul and muck removal. A D8 tractor-dozer spread the slag which compacted thoroughly under the heavy equipment.

A sizable amount of material was also used in building a causeway, 50 feet wide, along the water side of the pier for use as a working berm. This strip of solid ground permitted the contractor to build the pier with land rather than water equipment. It will be removed later by the Arundel Corp. in dredging the channel adjacent to the pier. The channel, leading out to Chesapeake Bay, is 150 feet wide and 39 feet deep below mean low tide.

(*Continued on next page*)

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To use Superior Cone-Fast Coil Ties is one direct means of cutting costs. The *exclusive* feature of this Coil Tie is the extension of the coil beyond the ends of the wire struts *(enlarged detail above)*. The reamed Coil Cone fits snugly over this projected coil. The Coil Cones are applied before the opposing panel is erected and the cone pointed Coil Bolts then engaged in the Coil Ties, an easy operation because of the large square opening in the cones. This simple operation is particularly advantageous when large panels are used for walls that do not permit a man inside the forms.

The Bolt Holders shown in the panel on the right keep bolts and washers on the panel while it is being stripped and moved for reuse.

Cone-Fast Ties are made for Coil Bolts ½" to 1¼" in diameter with safe working loads from 5,000 to 36,000 pounds for use with wood, combination wood and steel, and all steel forms to meet the requirements of every type concrete structure.

Preplan your form work to get the maximum uses from your form panels. The spacing charts in our catalog will help you design these panels for the average job and our engineering department will help you in the design of your special problems that are not covered by these spacing charts.

REQUEST a copy of our 56-page catalog. It contains a valuable table for spacing studs, wales, and form ties.

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C. & E. M. Photo
Workmen cut off treated timber piles—14-inch butts, 8-inch tips—with an Ingersoll-Rand chain saw.

New Pier to Handle Import Ore for B. & O.

(Continued from preceding page)

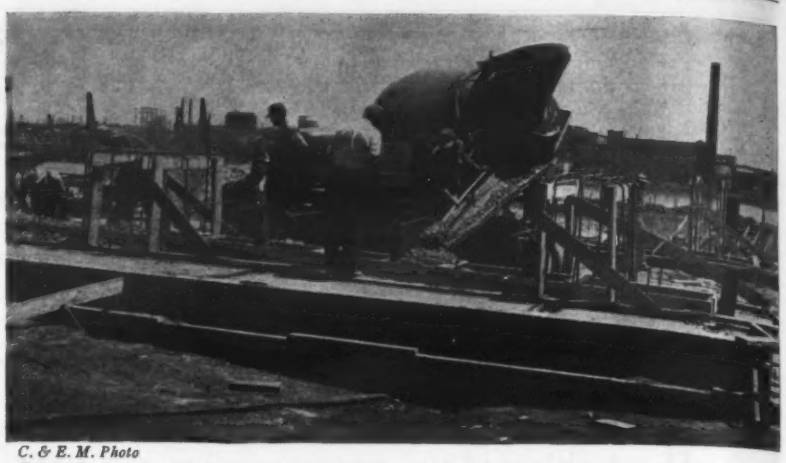
Approximately 530,000 cubic yards of dredging is being done by the Arundel dredge Governor Warfield, equipped with an Amsco 10-yard dipper bucket. The craft has three spuds, two forward and one stern, and loads the material excavated into mud scows which are towed down the bay and dumped in deep areas.

Pile Driving

The Empire Construction Co. put five crane rigs on the job for mucking out, pile driving, setting forms and reinforcing steel, and placing concrete. Four of these were Koehring—a 303 with a 40-foot boom; a 401 with a 60-foot boom; a 605 with a 75-foot boom; and a 701 with a 100-foot boom. The fifth crane, a Northwest, had an 80-foot boom and a 20-foot jib. The three cranes with the longest booms handled the pile driving, with three 60-hp boilers furnishing the necessary steam. Vulcan 50-C hammers were used for driving all types of piles.

Cast-in-place concrete piles in the north and south runway walls are driven on 3½-foot centers in rows of four piles for the north wall and three piles for the south wall, with the rows on 5-foot centers. They are Union Metal Monotube foundation piles, JN-14 type, No. 7-gage metal shells in minimum 50-foot lengths for the north wall and 40-foot lengths for the south wall, and tapered from 14-inch butts to 8-inch tips. To vary the lengths, extra sections were lap-welded on when needed. They were driven by a Vulcan 50-C hammer, with the necessary helmet, to 70-ton bearing. Piles were jetted where necessary to get required penetration. The shells were then cut off to grade, dowels inserted, and the tubes filled with concrete. The cut-off grade permits a 12-inch embedment in the dock wall.

Treated-timber piles in sheet-piling tieback walls are 40 to 45 feet long, with 14-inch butts and 8-inch tips, and were driven in rows of two with bearing values ranging from 25 to 30 tons. Piles were driven on alternate spacing of 3-foot centers. No jetting was required in driving piles for the tieback wall. The inside line of timber piles are battered 6 on 12; all other piles are plumb. Practically all the driving was done with 55-foot swinging steel leads. Timber piles were cut off to grade by an Ingersoll-Rand pneumatic-driven chain saw. They project 1 foot into the concrete.



C. & E. M. Photo
Concrete for the discharge-bin foundation on the Curtis Bay project is supplied from a Smith 5-yard mixer mounted on a Mack truck.

Steel sheet piling along the water sides of the pier are Carnegie MZ-38 sections in 60-foot lengths that were driven in pairs. Piling on the pier totaled 1,100 tons of steel sheet piling; 38,400 linear feet of Monotubes; and 6,500 linear feet of treated-timber piling in tieback walls and building foundations.

(Continued on next page)

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Dock Walls

After the piles were driven, a 6-inch mat of concrete was laid and roughly finished to seal off the mud underneath the dock walls. The north runway wall is 15 feet 9 inches wide measured from the front of sheeting to the back of the concrete, while the south runway wall has a maximum width of 10 feet 6 inches. Both walls have a maximum height of 10 feet, from the bottom of concrete to the 4½-foot-wide top width on which the crane rails are laid for the ore-handling machinery.

Forms for the walls are built of ⅝-inch plywood backed with 2 x 6 studs on 16-inch centers, and double 2 x 6 wales on an average 4-foot spacing. Panels are tied together with Richmond screw anchors. The walls are heavily reinforced, the Bethlehem Steel Co. of Sparrows Point, Md., supplying the job with 150 tons of reinforcing steel and 150 tons of structural steel for the substructure alone.

The 4,500 yards of concrete for the project came from the Arundel Brooks Pre-Mixed Concrete plant, two miles from the site, in Smith 5-yard mixers mounted on Mack trucks. Concrete was either chuted directly into the forms, or discharged into 1-yard buckets that were handled by the cranes with the smaller-length booms. The walls were poured in sections 54 feet long, with the end sections slightly longer to make up the full length. Concreting also included pouring foundations for discharge bins, conveyor framework, etc.

North and south runway walls are connected with 2-inch tie bars, spaced on 6-foot centers, and equipped with turnbuckles for tightening. The bars go through the walls 2½ feet above the bottom of concrete, and are completely embedded in the granulated-slag fill that comes up to within 1½ feet of the tops of the walls. The elevation of the runway portion of the walls for the crane rails is 9.26. Each track carries two 171-pound Bethlehem rails on 2½-foot centers and laid on steel ties 4 feet long.

Ore Unloading

The runway for the two ore unloaders carried on the dock walls is 498 feet long, with the tracks on 65-foot centers. The buckets on the unloaders have a 200-foot travel, with a maximum reach of 60 feet beyond the face of the pier in unloading a vessel. Buckets are either 4½, 7½, or 15-ton capacity, according to the individual requirements of the ore boat unloading at the pier. Bottom clearance of the buckets is 54 feet above mean low water. The capacity of the unloaders is 1,200 tons per hour of 150-pound ore, or 1,500 tons of 200-pound ore.

Each unloader drops the ore into a 100-ton receiving hopper that is screened by 15-inch square mesh to remove large pieces before it feeds onto the conveyor belt. The ore moves over the 48-inch conveyor belt, 865 feet long, at a speed of 400 feet per minute. This belt has a capacity of 1,500 tons per hour of 150-pound ore, or 2,000 tons per hour of 200-pound ore.

The belt conveyor transports the ore to a 500-ton-capacity surge and discharge bin from which it flows through feeders to a battery of hoppers constructed under loading tracks. The hoppers are equipped with automatic weighing devices that weigh the ore as it is discharged into railroad cars holding from 50 to 80 tons. Empty

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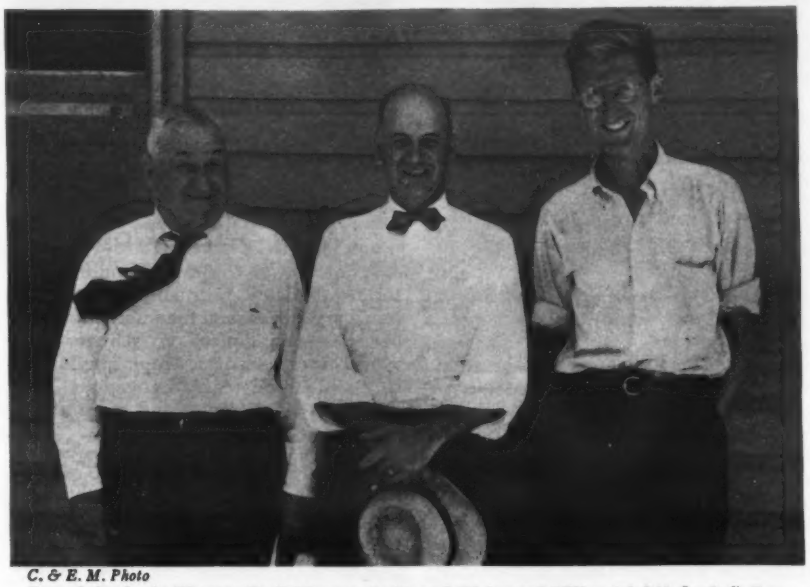

C. & E. M. Photo
Superintendents Thomas D. Caldararo (left) and Richmond Miller (right) flank C. Lester Kroll, Senior Assistant Engineer for the B. & O. Railroad.

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There is a generator of the size you need in the Fairbanks-Morse line, which ranges from 600 to 35,000 watts capacity—A.C., D.C. or A.C.-D.C.

Ask your construction supply dealer to give you all the details. If he hasn't the model on hand that you need, he can get it quickly. If you don't know who handles Fairbanks-Morse generators, write Fairbanks, Morse & Co., Chicago 5, Illinois.

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Arkansas Narrows Dam* gets a smooth, super-strong concrete face with U. S. Hydron® Form Lining

*Construction under supervision of Vicksburg District, Corps of Engineers, Department of the Army.

IN BEAUTY THERE IS STRENGTH. The massive Narrows Dam on the Little Missouri is built for the ages. The beautifully smooth concrete was cast against U. S. Rubber's Hydron Form Lining to give it greater resistance to abrasion and freeze-thaw cycles.

BILLIARD-BALL SLIPPERY is the downstream surface of the dam. Hydron absorbs the excess water and eliminates trapped air from the concrete, greatly reduces surface pits. This great "U. S." development comes in flexible sheets only 0.08 inch thick.

300,000 SQUARE FEET of Hydron were mounted to wooden forms quickly and easily with rapid-fire staple guns. Hydron is inexpensive, easy to ship, store, cut or trim. It can be used on big or small jobs, gives longer life, lower maintenance costs.

The engineers and contractors who use Hydron Form Linings report Hydron adds *years* to the life of concrete. Yet the total costs, including a satisfactory profit, is only 12¢ to 16¢ per square foot. The use of Hydron eliminates expensive hand rubbing. For more information write to address below.

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UNITED STATES RUBBER COMPANY
MECHANICAL GOODS DIVISION, ROCKEFELLER CENTER, NEW YORK 20, N. Y.

New Pier to Handle Import Ore for B. & O.

(*Continued from preceding page*)

cars are placed under the loading hoppers by electric pushers, which will also push the loaded cars to adjacent tracks where they will be made up into solid trains for movement to destination. The entire system is interlocked and electrically operated with automatic and semiautomatic controls, limit switches, etc. that regulate the flow of ore to the discharge bins.

The weight of the superstructure, including structural steel, machinery, conveyors, feeder, etc. is 1,850 tons.

Room for Expansion

While the present pier and its facilities can handle one vessel at a time, and load one railroad car per minute, the entire layout has been designed so that its capacity can be doubled as soon as justified by the increased volume of import ore. Enough room is available to extend the pier eastward in the direction of the existing B. & O. coal piers.

Plans are already prepared for the construction of three buildings at the pier site. They include a 42 x 50-foot brick substation; a 40 x 80-foot concrete-block service building; and a 50 x 80-foot cinder and concrete-block maintenance building. These buildings are under construction and are expected to be complete by the time the imported ores begin arriving from Liberia, Venezuela, Chile, and other foreign countries.

Personnel

The Empire Construction Co. of Baltimore employed a force of nearly 100 in executing its contract on the pier under the supervision of Thomas D. Caldararo and Richmond Miller, Superintendents.

The Baltimore & Ohio Railroad was represented on the pier construction by C. L. Kroll, Senior Assistant Engineer, from the office of J. W. Jones, Regional Engineer, in charge of the project. A. C. Clarke is Chief Engineer of the B. & O.; K. J. Wagoner is Assistant Chief; and C. E. Sloan is Engineer of Bridges, assisted by G. H. Dayett. L. P. Kinball is Engineer of Buildings and W. W. Gwathmey, Jr., is Engineer of Construction.

New Unit Reproduces Drawings, Maps, Etc.

The Model D Versa-Liner, a new full-size ammonia-type whiteprinter, is announced by Peck & Harvey, 5736 N. Western Ave., Chicago 45, Ill., manufacturer of reproduction equipment.

Using the dry ammonia-fume method of diazo reproduction, the Versa-Liner prints and develops blue-line, blackline, sepia intermediates, and other ammonia-type colored-line whiteprints. It plugs into any standard 115-volt 60-cycle ac line, using 19 amps. It uses a new superfluorescent light source, and lamps can be turned off and on without damage. The entire lamp assembly is removable without tools.

Designed for reproduction of line drawings, sketches, and other translucent originals, the new machine can be run by anyone, the manufacturer says. Application of a mechanical torque-converter drive provides quiet trouble-free speed control and drive mechanism. The ammonia-fume exhaust fan operates independently, allowing for evacuation of fumes when the machine is shut down. Both cut sheets and roll stock up to 42 inches wide, in any length, can be handled. The printer has variable speed from 4 inches to 5 feet per minute and the developer is set at 6 feet per minute. The heating element in the developer can be adjusted within a 40-degree range by means of a dial-operated resistance coil for processing different grades and weights of sensitized paper. All controls and delivery chutes are at the front, visible to the operator. A two-shelf front storage cabinet is included. A plastic plywood feedboard provides adequate working area for either stacking small prints or handling large tracings.

Peck & Harvey's Model D Versa-Liner prints and develops blue-line, blackline, sepia intermediates, and other ammonia-type colored-line whiteprints.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 21.

New Utility Crane With 5-Ton Capacity

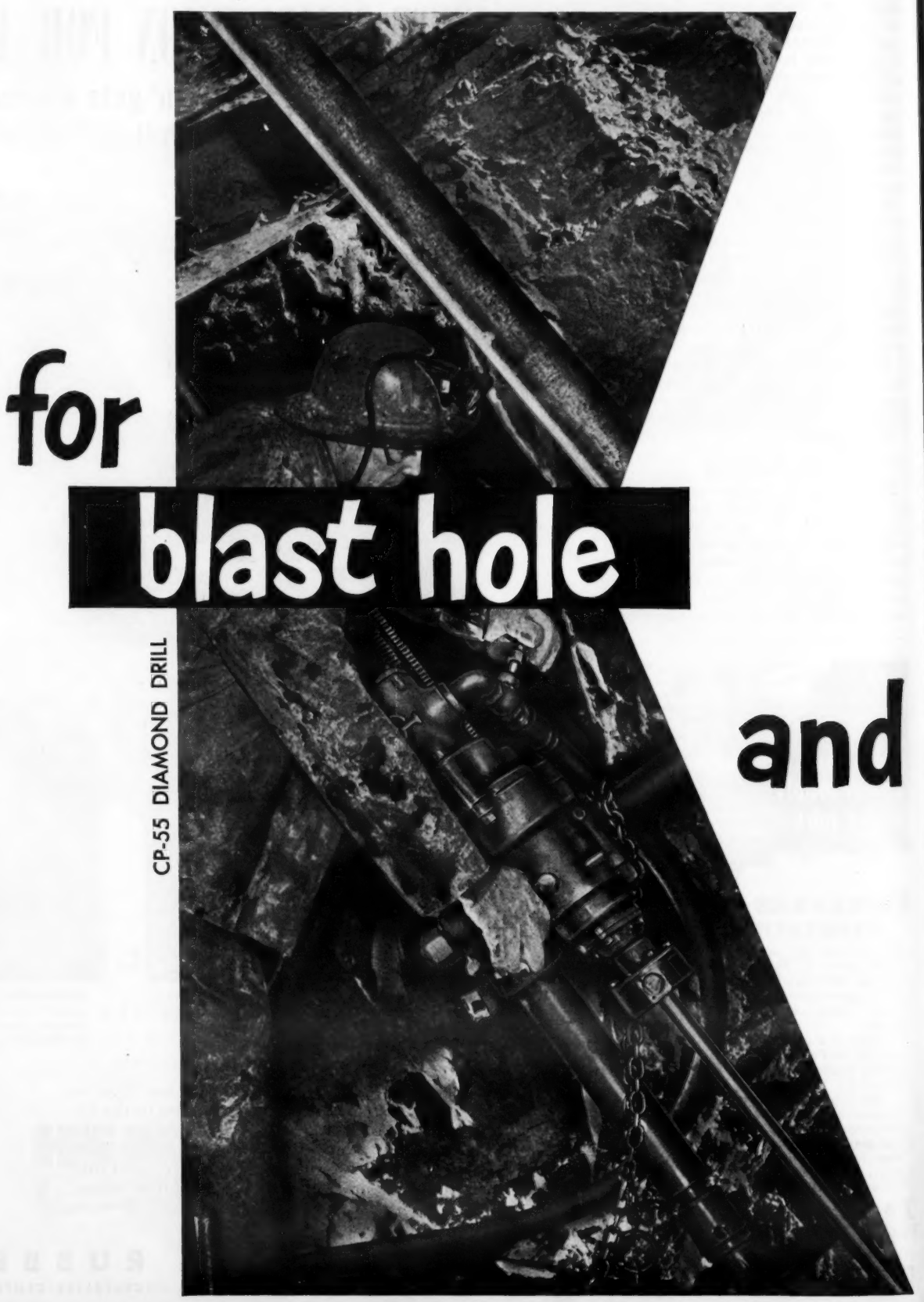
A new Handi-Crane for handling materials at plants, railroads, loading stations, and docks, and for public utilities, has been announced by Clyde Iron Works, Inc., Duluth 1, Minn. The Model UC is mounted on a Minneapolis-Moline Model UTI tractor and has a high-lift capacity of 5 tons.

The boom is raised and lowered by a hydraulic cylinder that allows control independent of any other operation. An 18 or 24-foot boom rotates a full 320 degrees and has an attached counterweight that permits the load to be swung at a constant radius with safety. Hydraulic stabilizers on the front end provide additional stability when handling loads over the side.

This 5-ton Handi-Crane mounts on a Minneapolis-Moline Model UTI tractor.

The crane has a short turning radius and a special roller-bearing steering mechanism that permits easy and fast maneuvering even in congested areas, the manufacturer says. A pintle hook makes it possible to use the crane for towing service as well as handling materials.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 95.

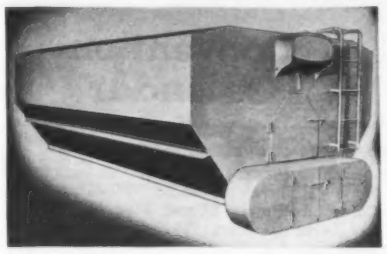


Handles Bulk Cement

The Cement Bulker, made by Schuch Bros. Machine Co., P.O. Box 3911, Detroit 27, Mich., is designed for use by concrete-block and other concrete-product manufacturers. The loading hatches and rear unloading door are constructed for canvas-bag loading and unloading to minimize dust. They have a new over-the-center locking device for easy opening. "No more threads to stick, bind, or wear out", the company states. Low center of gravity and a capacity of 100 barrels of hot cement are other features of the Bulker.

Unloading is accomplished with twin conveyor screws, each able to operate independently, driven by a Wisconsin 4-cylinder air-cooled engine. Motor controls extend to the rear of the Bulker for easier regulation.

The total time required to remove the motor for servicing need not exceed 5 minutes, Schuch says. The Bulker is available mounted on truck or trailer, or unmounted.



Twin conveyor screws unload the Schuch Cement Bulker. Hatches and doors have a new over-the-center locking device for easy opening.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 116.

McCulloch Enlarges Plant

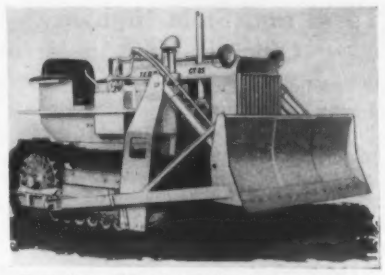
A $2,500,000 expansion program now under way will increase the Los Angeles plant area of McCulloch Motors Corp. from 75,000 to 324,000 square feet. It will add eight manufacturing bays, a recreation-cafeteria building, and new engineering and warehousing facilities. The new buildings will probably be ready for use next June.

A New Concrete Form

A new Atlas square-edge form has been announced by the Irvington Form & Tank Corp., 20 Vesey St., New York 7, N. Y., for use on structures where architectural concrete is required. The form is supplied with the improved Atlas Captive fastener permanently attached to it to eliminate the waste motion of extra handling and misplacing of parts.

The forms can be crane-handled in large panels or obtained in lightweight individual units for erection by one man. They can be used with wood or steel wales, with any standard make of wall ties, the manufacturer reports. Basic units are 12 inches wide and are supplied in lengths of 4 to 8 feet.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 99.



Terratrac GT-25 crawler tractors have a 20 drawbar and 25 belt horsepower. They have a hydraulic implement arm lift system.

A New 20-Hp Crawler

A new crawler tractor with a 20 drawbar horsepower, the Model GT-25 Terratrac, has been announced by American Tractor Corp., 200 Fort Wayne St., Churubusco, Ind. It is powered by a 4-cylinder Continental Red Seal industrial gasoline engine and features a Clark transmission, Warner gears, Spicer universal joints, Auto-Lite ignition, Donaldson air cleaners, Fram filters, and antifriction bearings throughout.

Other features include positive crawler traction for all-weather operation; a 20-inch clearance; track gages varying from 36 to 72 inches to meet individual requirements; and a hydraulic system for operating bulldozers, loaders, winches, earth drills, cranes, snowplows, and other tractor attachments. This unit has a total weight of approximately 3,290 pounds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 37.

Data on Speed Reducers

Four new engineering bulletins illustrating and describing the improved Falk parallel-shaft speed reducer and the right-angle speed reducer, both horizontal and vertical, have been issued by The Falk Corp., 3001 W. Canal St., Milwaukee 8, Wis.

Falk standard speed reducers feature precision-cut herringbone double helical gears, and are available with sleeve bearings or roller bearings, depending upon applications. The right-angle speed reducers have anti-friction bearings and are furnished with spiral-bevel precision-cut helical gears. The vertical right-angle units are equipped with a patented oil pump which assures positive lubrication at all times, the catalog says.

These speed reducers are designed for a wide variety of power-transmission requirements and are rated according to the standards of the American Gear Manufacturers Association. The bulletins include data on methods of selection, horsepower-rating tables, torque-capacity tables, dimensions, an order guide, and full specifications.

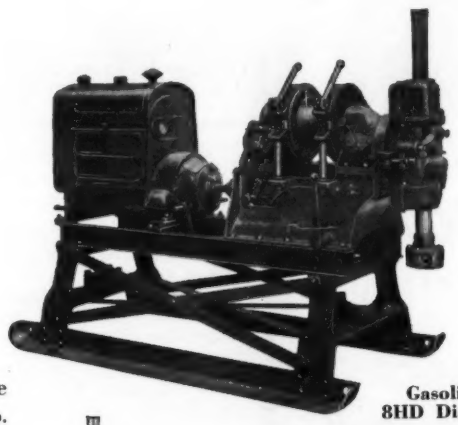
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 81.

Bulletin on Trenching Unit

A 4-page bulletin describing the Ottawa trencher has been prepared by Ottawa Mfg. Co., Ottawa, Kans. The trencher is designed for a maximum digging depth of 10 feet with regular equipment and a maximum width of 22 inches. A rotary conveyor delivers dirt either left or right at two different speeds. The unit has 8 forward crawling speeds and 2 reverse, and is powered by a Model VP4 Wisconsin air-cooled engine.

The folder illustrates all construction features of the machine and gives specifications and illustrations. It also mentions that the Ottawa trench digger has a depth gage, available as an extra, which will keep the bottom of the ditch on a previously determined grade.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 2.



Gasoline-driven CP No. 8HD Diamond Core Drill

Gasoline-driven CP No. 15HD Diamond Core Drill

Built for exploratory drilling from the surface, the gasoline-driven, skid-mounted CP No. 15HD and No. 8HD DIAMOND CORE DRILLS are readily moved from hole to hole under their own power.

Both are specifically designed for engineer's test borings, mineral prospecting and shallow oil structure drilling. Operating at the continuous high speed made possible by bortz bits, they give exceptional performance with remarkably low maintenance.

CP No. 15HD, with E-EX fittings, has a capacity of 2250 feet; CP No. 8HD, a capacity of 1250 feet. Both are also available with electric or Diesel drive, and with hydraulic head in place of screw feed.

Write for Bulletin 313

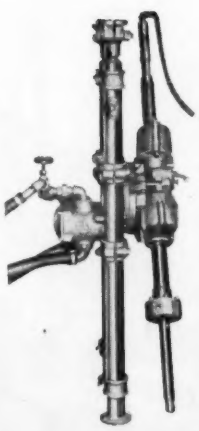
exploratory drilling

CP-55—FASTEST DRILL IN ITS CLASS

—designed around the improved CP Rotary Air Motor —the fastest, most powerful rotary motor on a diamond drill. For underground blast hole and exploratory drilling, the CP-55 DIAMOND DRILL is easy to handle; weighs only 160 pounds; requires a minimum amount of air per foot drilled.

Conservatively rated at 500 feet with E-EX fittings. Equally efficient for coring, non-coring or blast hole operations.

Write for Bulletin 318



Double-column mounted CP No. 12 Diamond Core Drill

Designed for underground use, the air-driven CP No. 12 DIAMOND CORE DRILL has a double-column mounting. Powered by a CP 25 h.p. rotary twin-air motor, it gives the same excellent performance as all other CP Diamond Drills. Its capacity, with E-EX fittings, is 1250 feet.

Motor, column and swivel head are readily dismantable for convenient underground transportation to "hard to get at" places.

Write for Bulletin 313

CHICAGO PNEUMATIC TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

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ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Local and State Highway Officials Meet in Jersey

Freeholders and engineers of New Jersey's 21 counties met members of the State Highway Department recently to discuss ways and means of coordinating the 8,000 miles of county and state highways and developing uniform standards in road-building procedures wherever possible. Highway marking, standard bidding procedures, and prequalifications of bidders were discussed. The meeting was the first of a series planned by the State Highway Department.

RUNWAYS BECOME SPEEDWAYS

WHEN POURING CONCRETE WITH GAR-BRO Power-carts

...HANDLE MORE THAN 3 PUSH CARTS!
...TRAVEL 2 TO 3 TIMES AS FAST!

ONE MAN WITH a Power-cart can do as much work per day as 6 to 10 men with wheelbarrows. Up-hill, down-hill, over runways or rough ground, the Power-cart moves a 14 cu. ft. load at speeds up to 12 mi. per hour. Get the facts on its low price, low operating cost and low maintenance cost; write for Bulletin No. 83.

GAR-BRO MANUFACTURING COMPANY
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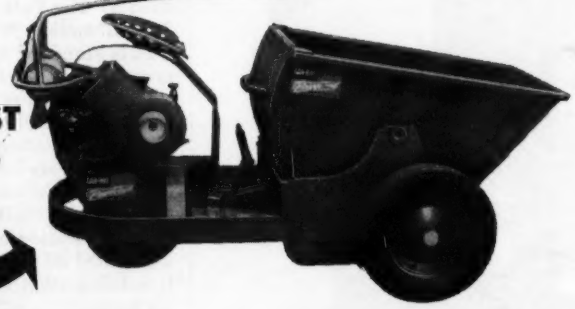


Convention Calendar

December 4-7—AASHO Meeting
Annual Meeting, American Association of State Highway Officials, McAllister and Columbus Hotels, Miami, Fla. Hal H. Hale, Executive Secretary, 917 National Press Bldg., Washington 4, D. C.

December 10-17—Pan American Road Congress
Fifth Pan American Highway Congress, Lima, Peru. International Road Federation, 550 Washington Bldg., Washington 5, D. C.

January 3-5, 1951—Weed-Control Conference
Fifth Annual Meeting, Northeastern Weed Control Conference, Hotel New Yorker, New York, N. Y. Walter C. Jacob, Secretary-Treasurer, Long Island Vegetable Research Farm, Riverhead, N. Y.

January 6, 1951—Brazil Road Show
Road Show, Brazil National Highway Department and Associacao Rodoviaria do Brasil, Rio de Janeiro, Brazil. Ing. Jose Maria Carre, Delegado Executivo, Associacao Rodoviaria do Brasil, Caixa Postal 3451, Rio de Janeiro, Brazil.

January 9-12, 1951—Highway Research Board
Annual Meeting, Highway Research Board of the National Research Council, National Academy of Sciences Bldg., Washington, D. C. Roy W. Crum, Director, 2101 Constitution Ave., Washington 25, D. C.

February 5-7—Asphalt-Paving Men
Annual Meeting, Association of Asphalt Paving Technologists, Hotel Cosmopolitan, Denver, Colo. Ward K. Parr, Executive Secretary, 1224 E. Engg. Bldg., Ann Arbor, Mich.

February 11-15, 1951—National Ready Mixed Concrete Association and National Sand & Gravel Association
Twenty-First Annual Convention, National Ready Mixed Concrete Association, and Thirty-Fifth Annual Convention, National Sand & Gravel Association, The Roosevelt Hotel, New Orleans, La. V. P. Ahearn, Executive Secretary, 1325 E St., N. W., Washington 4, D. C.

February 26—March 1, 1951—AGC Meeting
Annual Convention, Associated General Contractors of America, Statler Hotel, Boston, Mass. H. E. Foreman, Managing Director, Munsey Bldg., Washington 4, D. C.

March 12-14, 1951—ARBA Meeting
Annual Meeting, American Road Builders' Association, Shroeder Hotel, Milwaukee, Wis. Lt. Gen. Eugene Reybold, Executive Vice President, International Bldg., Washington 4, D. C.

ARBA Board Men Meet

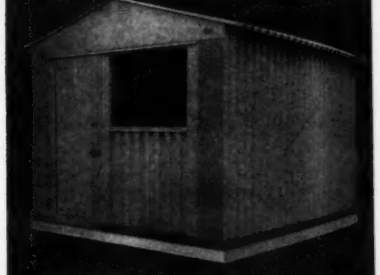
September 14 and 15 were busy days in Washington for the American Road Builders' Association Board of Directors and committees, who met to discuss membership drives, the Annual Meeting next March, and the Road Show.

The time and place for the next Road Show will be set as soon as the international situation makes advance planning possible. This decision was reached at a joint meeting of the ARBA Road Show Committee and the Exhibit Committee of the Construction Industry Manufacturers Association, the ARBA Manufacturers' Division.

The Special Membership Committee chairmanned by Lt. Gen. Eugene Reybold held its initial session during the two days. The Manufacturers' Division reported that CIMA is making good progress toward extending its membership.

The Board of Directors also decided to combine the Annual Banquet, scheduled to conclude the Annual Meeting next March, with the Annual Dinner of the Wisconsin Road Builders' Association. The Wisconsin men's annual meeting will follow the ARBA sessions.

A 10' X 12' LOW COST STEEL BUILDING OF 1,000 USES



Portable or Permanent
USF HANDY-HUT
No Field Welding or Riveting
2 Men Can Erect
Expansible!

Just the ticket for a field office, tool house, storage house, pump house or any one of a thousand uses for contractors and engineers. The USF Handy-Hut is an all-steel, prefabricated formed steel frame that simply bolts together with box corrugated roofing and siding sheets that attach with clip-and-wedge fasteners. No special tools are needed, no field punching, welding or riveting is required. Meets fire and windage codes most localities and is suitable for either permanent or portable use. Multiple units may be erected to accommodate any size requirement without special engineering.

USF also produces larger steel buildings of the same general construction in 10' and 12' clear heights with 26' or 30' span widths for erection in length multiples of 13'-4" to any desired size.

WRITE FOR DATA

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Z-D Arch Roof Built On Traveling Forms

Denver Municipal Stadium Is Designed and Built Similar To Big Military Hangars in South Dakota and Maine

C. & E. M. Photo

A general view of Denver's new Municipal Stadium, showing the heavy buttressed sides and part of the falsework. Swinerton & Walberg Co., of San Francisco, is the contractor.

+ "DENVER builds."

That is the slogan on a big construction sign near the new Denver Municipal Stadium near 46th and Brighton Blvd. in the northern part of the city. The reason for the sign and the construction activity is a big $2,500,000 stadium, which by next year will house the National Western Stock Show, major-league ice hockey games, and other municipal events.

Swinerton & Walberg Co., noted building contractor of San Francisco, has a $1,275,000 contract for the main part of the new 336 x 301.8-foot building. Supplemental plumbing, heating, electrical, and other contracts, plus engineering and overhead costs, determine the difference between the contract figure and $2,500,000.

Z-D Design

The Z-D arch roof, a thin reinforced-concrete shell, has a clear span of 253.67 feet. The building, designed by Roberts & Schaefer of Chicago, is similar to huge plane hangars built since World War II at Rapid City, S. Dak., and at Limestone, Maine. The only basic external difference is the fact that instead of sliding hangar doors, the Denver stadium building is to have an ornate glass front, with a theater marquee and entrance. Access ramps at the back of the building will permit stock to come in from nearby stockyards.

Internally, the design differs slightly from the hangars because there are no tension ties across the base in the Denver building. Heavy footings, 50 x 8 x 6 feet, carry massive piers on either side which act as a buttress against the outward thrust of the arched roof. The roof thickness varies from 6 inches at the spring line to 4 inches at the crown. Each 56-foot roof section contains 760 tons of concrete and 60 tons of steel reinforcement.

Lorimer & Rose of New York and Roland L. Linder of Denver acted as codesigners with Roberts & Schaefer of Chicago.

Forming

Formwork for the base and pier pours was not at all difficult, because it consisted merely of nailing plywood facing to timber studs, and anchoring the panels in place with patented form ties. The difficult part was the big arched roof, which rose at the center point to 90 feet from the ground.

M. C. Burns, Project Superintendent for Swinerton & Walberg Co. for the past 16 years, is experienced on heavy buildings, structures, and concrete bridges. He designed the traveling timber falsework which supports each 56-foot roof pour, with Gerald Osburn as his assistant; Bill Raymor, Steel Superintendent; Phil Briggs, Concrete and Lab Foreman; Bill Jorgensen, Accountant; and Robert Murray, Engineer.

The result is a massive set of timber falsework which contains about 250,000 fbm of timber, most of it structural-grade Douglas fir. There are 7 main towers, each containing 32 upright 6 x 6 members, and tied together by sway and X-bracing. With the exception of the small 2 x 6 sway braces, the main members are all bolted.

The base of each tower terminates in dual 4 x 12 timbers. The falsework is carried on a total of 100 5-ton V-caster steel wheels. These casters are very effective and friction-free while moving the falsework.

During the pour, of course, the wheels are off the tracks and the weight is supported on timber cribbing.

Tops of the timber towers terminate in 128 built-in steel connnections, which are equipped with Simplex screw jacks. The jacks carry a heavy 8-foot timber

(*Continued on next page*)

Jobs Done Quicker, Cheaper

Attached to Tractors, Bulldozers, Motor Graders and Scrapers, the Automatic Slope-Meters are in use on the construction of highways, airports, dams and building sites. Slope-Meters are compact, sturdily constructed instruments that will automatically show the operator the exact grade or slope on which he is working.

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MOUND, MINNESOTA

B.F.Goodrich

Hauling giant loads over blasted rock this B. F. Goodrich tire outlasts them all

IN ROAD contracting service in Tennessee, North Carolina and Virginia, the equipment pictured above is engaged in the tire-killing business of working its 32,000 pounds over the sharp rock of blasted terrain. Add a total load weight of 16 cubic yards of rock and earth, and it's easy to understand why bruises and blowouts make off-the-road tires a major cost item in such equipment.

Such was the story, at least, until B. G. Young & Sons of Johnson City, Tenn., owners of the fleet, turned to B. F. Goodrich *double nylon shock shield* tires to combat the high cost of tire mortality in such rugged service. Since then, costly road delays and work interruptions have been cut to a fraction of what they had formerly considered normal. The BFG Universal tires shown above, for example, have been in service for well over a year—*and not one has yet been removed from its wheel.* Mr. B. G. Young says, "The service we obtain from B. F. Goodrich tires with nylon shock shield is far and beyond anything we have ever experienced before."

Only B. F. Goodrich off-the-road tires have the *double nylon shock shield.* (It's patented.) Layers of nylon cord, built between the tread and body plies, shield the cord body by smoothly distributing shocks and strains. This plus factor of extra mileage and service hours in BFG tires is yours at no extra cost. Then, too, because there's a specially-designed deep tread for every need, you can look forward to good traction far beyond the time when ordinary tires must be changed over to service on free-rolling wheels.

So see your B. F. Goodrich dealer. Specify BFG tires for your new equipment. Enjoy longer tire service and lower overhead offered you by *The B. F. Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

Z-D Arch Roof Built On Traveling Forms

(*Continued from preceding page*)

truss, built congruent to the roof arch. This truss consists of double 3 x 8 timbers, bolted through filler blocks, with 3 x 6 fir uprights using timber connectors. Fir joists 2 x 8, on 18-inch centers, carry 1-inch sheathing.

The jacks allow the arch truss to be dropped about 4 inches from the roof concrete line. This gives the entire falsework sufficient clearance to move. Only 7 railroad jacks are necessary to move the falsework ahead.

The traveling arch, it is estimated, will save about 25 weeks of form erection time over conventional building methods, as well as substantial amounts of labor and materials. Time is—or was—important. When the job began in September, 1949, Denver city officials hoped to have the building finished in time for the January 1951, National Stock Show. The project was progressing on schedule, with everything favorable, when several minor jurisdictional labor disputes delayed the work. A major strike was then called by the Denver building trades union, and the project was idle for nearly 3 months.

C. & E. M. Photos

Plenty of preparatory work precedes every stadium pour. Here men place steel mesh and drive the small double-headed nails which hold the work insulation in place.

It is estimated that the structure will be completed by May, 1951.

Preparatory Work

A pouring schedule of one 56-foot section every 3 weeks allows time for the extensive preparatory work which precedes each pour. First of all, the entire form deck must be covered with rectangular blocks of 1½-inch cork, in 18 x 36-inch pieces. The cork is for acoustical and insulation improvement in the stadium. Each piece is anchored to the concrete by 6 nails, but the nails might not be necessary if the men forgot them, because the cork contains good bonding voids which the fresh grout will flow into.

Double mats of 6 x 12 x No. 0-gage steel wire mesh with three layers of steel bars between are then placed on the cork, and supported. In each pour there are two halves of the heavily reinforced external beams which protrude off the shell, plus one complete beam. The plywood forms for these members must be set up and tied. Electrical conduits and certain other miscellaneous fixtures are also installed.

The roof pours began at the west end, after several foundation sections had gone ahead out in front, and the building is being finished as it progresses to the eastern end.

Concrete Placing

The most important concrete pours, naturally, are the 56-foot roof sections. Containing about 760 tons of concrete, these sections are being placed in an average time of 10 hours by a 65-man crew.

To make a pour, work starts simultaneously from both sides. At each side there is a 1½-yard crane, with 115 feet of boom, including a 15-foot jib. These cranes hoist concrete from 8 of the Ready Mixed Concrete Co.'s fleet of truck mixers, by means of 1-yard Gar-Bro buckets. These buckets are emptied in 2-yard King and Kringle deck hoppers on the two working platforms on each roof half and distributed to chutes by buggies.

The bottom 50 feet of the roof pour is perhaps the most difficult to place, because the pitch of the roof is greatest there. The first concrete is ordered with a 4-inch slump. It, like the rest of the structural concrete, is a 6¾-sack mix, with 1,210 pounds of sand, 1,800 pounds of ¾-inch crushed gravel, and 1 ounce of Protex air-entraining agent per cubic yard.

As the cranes hoist the concrete to the back hoppers, chutes are laid to train the material to the roof slab and beams below each platform. The pour is started by placing about 10 feet in the external beam forms. Then about 8 feet of deck is placed and vibrated. Wooden nailing strips for permanent roofing are also used for screeds. High-early cement causes the mix to set

(*Concluded on next page*)

Hold

FAST MIX SCHEDULES

with

VILTER

Refrigeration

When concrete or its ingredients must be chilled to meet rigid specifications, don't use old-fashioned methods. Modern Vilter Refrigeration is today helping Dam Project Contractors fulfill contract requirements with fast mixing schedules. Missing a mix schedule by as little as a single minute per mix costs *you* money. Be certain of your profits with dependable Vilter Refrigeration.

CHILL WITH PAKICE

Vilter PakIcers make crystalform ice as you need it—right on the job. PakIce, pumped to the mixer in proper quantities melts quickly, chills mix fast, really *shortens* mix time.

CHILL WITH COLD WATER

Vilter Supercapacity Water Coolers quickly supply you with great quantities of cold water for mixing or aggregate chilling by inundation.

CHILL WITH COLD AIR

Vilter Air Units deliver low air temperatures for aggregate cooling with cold air. Adequately designed for large air volumes, you'll be able to meet requirements everyday.

Let a nearby Vilter representative show you how many ways you can save with Vilter Refrigeration.

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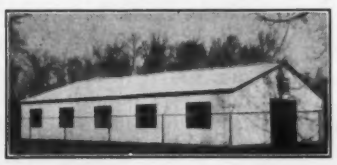

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FOUR MODELS

Load 3 to 8 Yards per min.

SELF - PROPELLED

SELF - FEEDING

For loading: sand, gravel, stone, topsoil, coal, snow and similar materials. One man operation, wheel or crawler mounted. Furnished with swivel chute or with swivel belt conveyor.

Special new features include: Sealed anti-friction bearings on head and tail shafts, two or four wheel drive, hydraulic raising and lowering, manganese or roller chain.

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FLAT and TROUGH BELT CONVEYORS

For handling all types of loose or package materials. Mounted on "V" or mast truck with swivel wheels or for permanent installation.

UNDERCAR UNLOADERS

Designed and built especially for loading sand, gravel, and crushed stone. Combination belt and positive chain drive. Capacity up to 5 tons per minute. Ask for bulletin No. 501.

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Channel or Lattice Frame construction. Made in easily assembled standard sections for permanent or portable installation. All sizes and capacities available for handling all types of aggregates as well as bagged or packaged materials.

For further information write, 'phone or wire.
Experienced Haiss Representatives are located in all principal cities.

GEORGE HAISS MFG. CO., INC., Division of PETTIBONE MULLIKEN CORP

141st to 144th St. on Park Ave., NEW YORK 51, N. Y. Phone Mott Haven 5-2200

4700 W. Division St., CHICAGO 51, ILLINOIS Phone Spaulding 2-9300

HAISS NEW YORK CHICAGO

UNIVERSAL CEDAR RAPIDS

rapidly, and the only finishing it requires is a handfloat dressing after men with shovels have leveled it roughly.

When the top of the roof is reached, after crews have poured both lower portions, Gar-Bro concrete buggies take over from a top platform and distribute the last part. The finishing is the same. Sealtex curing solution is being used.

Careful Checking, Now

Extremely careful concrete technology now enters the picture, because the falsework and form trusses cannot be dropped until the test cylinders show 2,500-psi strength and the modulus-of-elasticity psi reaches 2,000,000. Gene Greenwood, Roberts & Schaefer's representative, makes these determinations and gives the order when to decenter the falsework and move it ahead. It is not unusual to develop 3,400-pound concrete in 4 days after the pour, and to be cleared to move ahead in that time.

Denver's new Municipal Stadium, when completed, will be an outstanding building in the Rocky Mountain Empire and one of the most beautiful in Denver. Laymen who visit future municipal events, and who are unfamiliar with the many military uses the Z-D design has filled, will be sure to marvel at the roominess and originality of this structure.

Personnel

Superintendent Burns is directing field operations under Jack Lindsay, Partner and Los Angeles and Denver District Manager for Swinerton & Walberg. Carl Jacobsen is Project Manager for the City and County of Denver, with Richard Bennetts, Head of of the Public Building Units Department, in charge.

William F. Henninger is City Planning Director; Terry Owens is City Engineer; T. P. Campbell is Manager of Parks and Improvements; and Quigg Newton is Mayor of the city of Denver.

Plaster Partitions Tested

The resilience of a studless 2-inch solid vermiculite-plaster partition was compared to that of a sand-plaster partition in impact tests made by the Detroit Building Trades School at Detroit, Mich. The two partitions tested were of identical conventional construction, 8 feet high x 16 feet long, and were rigidly braced.

The tests were made in accordance with a standard test procedure and acceptance conditions, which require that the partition be struck four times at its center by a 6-pound sandbag, dropped from 30, 45, 60, and 90-degree positions with respect to the face of the partition.

A partition passes this test if, during the four drops, no cracks occur through which daylight can be seen; no loose material results from the impacts; the temporary deflection does not exceed 1 per cent of the partition height; and the permanent set of the partition is not over 0.1 per cent of the partition height —0.096 inch in this case.

Both partitions passed the test. At the fourth drop the vermiculite partition showed no permanent set and the sand partition had a permanent set of 0.09 inch. The partitions were subjected to additional impacts from the 90-degree position. At the seventh drop the vermiculite partition had a permanent set of 0.03 inch compared with 0.14 inch for the sand partition. Failure due to a permanent set did not occur in the vermiculite partition until the ninth drop.

Aluminum Extrusions

Basic engineering principles for most effective use of extruded-aluminum shapes are explained and illustrated in the 1950 edition of the 138-page book "Designing With Aluminum Extrusions", issued by Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky. The new book breaks down the advantages of the extrusion process into eight principles of design. Then it illustrates and explains each of these by diagrams, charts, and pictures of actual parts.

The books are available without charge to engineers, architects, designers, and others requesting them on company letterhead.

LUBRICATE WITH "TOUGH" GREASES ALL YEAR 'ROUND

One easy stroke of hand lever dispenses Lithium, Barium and heavy soda-base greases in coldest weather. Heavy-duty Gre-Zer-Ator fits 25- to 40-lb. standard grease container and has 10-ft. wire braid hose. Reservoir booster assembly develops 7,500 lbs. pressure and supplies enough grease to fill 100 bearings, or entire pail of grease can be dispensed by holding booster valve open and operating pump handle.

Precision workmanship—fully guaranteed.

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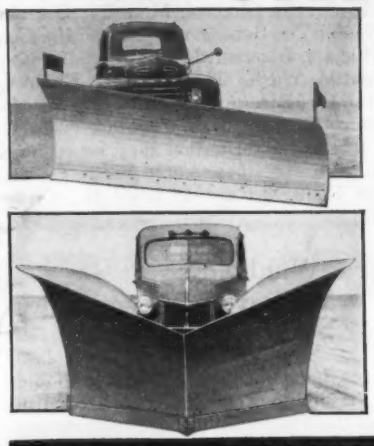
GET BETTER RESULTS WITH *GLEDHILL* PLOWS



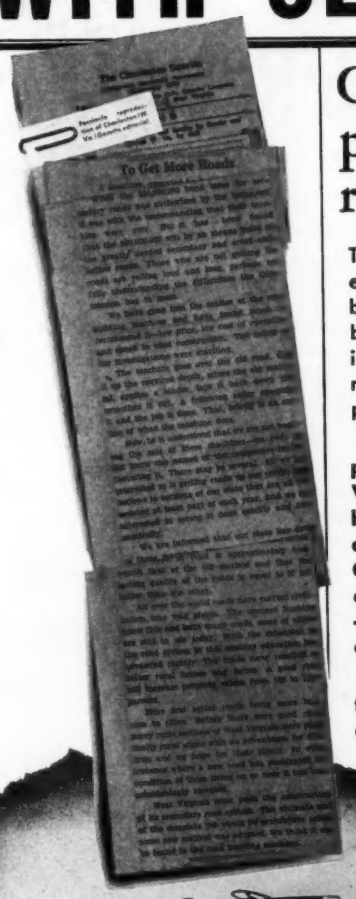
The well known, efficient one way plow—fits all trucks—easily attached—fold back hoist—automatic blade trip—sturdy, well balanced construction.

Gledhill's V-Plow — Wide wing span—heavy duty construction — interchangeable — direct lift — reasonably priced.

Get complete specifications from any Gledhill distributor or, write the factory.

THE GLEDHILL ROAD MACHINERY CO.
GALION, OHIO

WEST VIRGINIA SOLVING ROAD BUDGET PROBLEM WITH SEAMAN MIXERS!



Charleston Gazette in editorial points to Seaman as answer to road system extension . . .

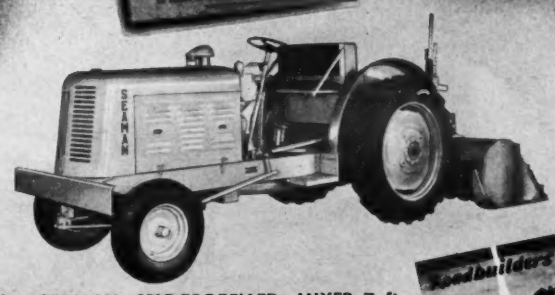
The Charleston Gazette, quite properly, does not mention the SEAMAN by name, calling it only a "road-building machine," but the story is about seven SEAMAN MIXERS now in use by West Virginia. In part, here's what the Gazette says:

"Here is an answer to the prayers of those dwellers in West Virginia hills who are harassed by their inability to get in and out the greater part of the year. Our many miles of dirt roads — often no better than mud roads — are the cause of continual complaints . . .

"We have gone into the matter of the road building machine and have found much to recommend it — low price, low cost of operation and speed in road construction. The result of the investigation was startling.

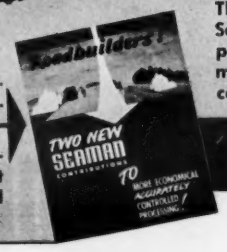
"The machine goes over the old road . . . mixes the old material and applies a binder, lays it back down and smoothes it out. A following roller compacts it and the job is done.

" . . . It is stated that the cost of construction of this type of road is approximately one-fourth that of the old method . . ." West Virginia's experience with the SEAMAN MIXER is duplicated the country over. The SEAMAN *is by far the best answer* to high quality, low cost stabilized roads.



The SEAMAN SELF-PROPELLED MIXER 7 ft. mixing width. Gasoline or Diesel powered.

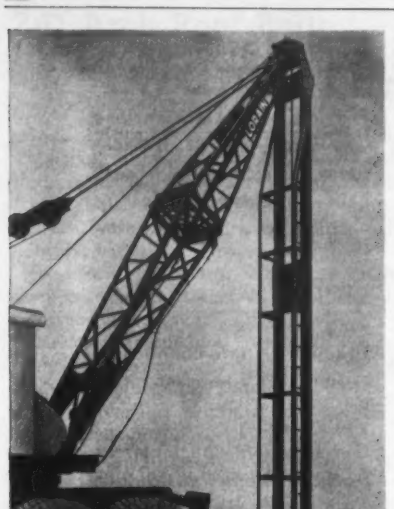
The SEAMAN SELF-PROPELLED TRAV-L-PLANT. Like the Self-Propelled Mixer except for addition of spray bar, pump, pump tachometer fifth wheel assembly and meter for precision control of bitumen or water application. 7 ft. mixing width. Gasoline or diesel powered.



Here's a Bulletin describing the SEAMAN Self-Propelled Mixer and the TRAV-L-PLANT. Sent to you FREE on request. Ask for "Self-Propelled Bulletin."

SEAMAN MOTORS, INC.

282 N. 25th St., Milwaukee 3, Wis.



Shown here attached to a Lorain Moto-Crane, the Lewis pile-driving leads may be fitted to the boom heads of most makes of cranes.

Pile-Driving Leads

Newly designed all-steel all-welded pile-driver leads and related accessory equipment have been announced by Lewis Welding & Engineering Corp., Bedford, Ohio. By a simple change in the adapter plates at the top of the leads, they may be fitted to the boom heads of cranes of almost any make. The complete package consists of suitable adapter plates, one-piece 30-foot channel-type leads with ladder, a 2,500-pound drop hammer, a 14-inch driving plug, and a follower cap. Twenty-foot extension leads are available also. This equipment may be purchased as a complete package or by individual items, Lewis says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 108.

Bundling-Chain Uses

A complete line of bundling chains for varying uses is announced by the Round Associate Chain Cos. The chains are supplied in 5/8, 3/4, and 7/8-inch sizes and in any desired length. They are of the close-link style and may be obtained in low or high-carbon steel or alloy depending upon the size of load to be lifted and the type of service. Ends are furnished with heavier links, rings, or pear-shaped links as desired.

The chains can be used for bundling bar or sheet steel, and pipe; handling timber and boxed or packaged goods; and securing loads to truck beds. They are available from the Bridgeport Chain & Mfg. Co., Bridgeport, Conn.; The Cleveland Chain & Mfg. Co., Cleveland, Ohio; Round California Chain Co., S. San Francisco and Los Angeles, Calif.; The Round Chain & Mfg. Co., Chicago, Ill.; Seattle Chain & Mfg. Co., Seattle, Wash.; The Southern Chain & Mfg. Co., Chicago, Ill.; Seattle Chain & Mfg. Co., Seattle, Wash.; The Southern Chain & Mfg. Co., Birmingham, Ala.; and Woodhouse Chain Works, Trenton, N. J.

Further information may be secured from any of these companies. Or use the Request Card at page 16. Circle No. 91.

New Withholding Rates On Revised Payroll Chart

The new revised edition of the Delbridge Social Security and Withholding Tax Chart, showing the new withholding deductions effective October 1, 1950, and the 1½ per cent social-security deductions, has been announced by Delbridge Calculating Systems, 2510 Sutton Ave., St. Louis 17, Mo. The chart is a hinged-card visible-index system designed for all payrolls; it is issued in four editions for weekly, biweekly, semimonthly, or monthly payroll periods. All editions include a set of tables treating daily and miscellaneous-period deductions.

An exclusive feature is the three-line grouping of answers which eliminates reading across columns. The operator spots the top-line, center-line, or bottom-line answer in the reference group. The Delbridge Chart is warranted accurate by Lloyd's of London.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 115.

Byers Appointment

W. J. Binder is now Manager of the Engineering Service Department of A. M. Byers Co., Pittsburgh, Pa. Mr. Binder has been with Byers since 1946.

MARVEL CONCRETE VIBRATORS

1½ H.P. to 5 H.P.

The standard with contractors for many years.

ALL MODELS NOW EQUIPPED WITH AUTOMATIC CENTRIFUGAL CLUTCH AS STANDARD EQUIPMENT

Write for full information

MARVEL EQUIPMENT CORPORATION
215-217 EAGLE STREET BROOKLYN 22, N. Y.

"Surveyed" your hauling costs lately?

DODGE trucks are "Job-Rated" to cut costs!

"Job-Rated" ...for low cost transportation

It's a pleasure to "survey" truck operating and maintenance costs—when they're *low*.

And the best way to keep costs low is to standardize on Dodge "*Job-Rated*" trucks—because they're "*Job-Rated*" for low-cost hauling.

Dodge trucks are powered with engines that are "*Job-Rated*" to give you top-notch performance, with economy. You'll enjoy lower gas and oil costs . . . fewer repair bills, too.

Remember . . . "It's a long haul between overhauls" with Dodge "*Job-Rated*" trucks!

Take a look at the list of other Dodge truck advantages at right. Then . . . for a good deal . . . see your Dodge dealer today!

POWER: . . . 8 great truck engines—each "*Job-Rated*" for *PLUS* power.

ECONOMY: . . . priced with the lowest. "*Job-Rated*" for dependability and long life.

BIGGER PAYLOADS: . . . carry more without overloading axles or springs because of "*Job-Rated*" *WEIGHT DISTRIBUTION*.

EASIER HANDLING: . . . sharper turning! Parks in tight places. "*Job-Rated*" maneuverability!

COMFORT: . . . widest seats . . . windshield with best vision of any popular truck. Air-cushioned, adjustable "chair-height" seats.

SAFETY: . . . finest truck brakes in the industry . . . hand brake operating independently on propeller shaft on *all* models—½-ton and up.

With all their extra value DODGE "Job-Rated" TRUCKS are priced with the lowest

A New Deal in FINE FOODS GIFTS

9 Delicacies in Imp. Basket $4.90 Delivered

SUBSTANTIAL SAVINGS TO BUSINESS CONCERNS

Food delicacy baskets and trays at volume prices. Send customers and employees handsome assortments, shipped without charge. $3.75 to $25.

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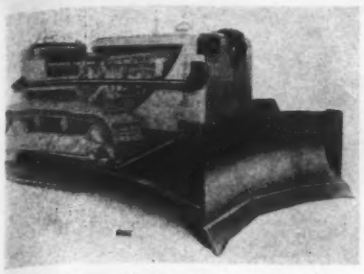


This U-shaped bulldozer for Caterpillar D8's is designed for long pushes with minimum end spillage. It's the No. 8U Model.

New U-Shaped Dozer Enables Long Pushes

A new large-capacity U-shaped bulldozer for use with D8 track-type tractors has been added to the line of Caterpillar Tractor Co., Peoria 8, Ill.

The No. 8U is similar to the standard Caterpillar 8S bulldozer except for the U-shaped blade which necessitates longer push arms. The complete unit is cable-controlled and consists of blade, push arms, trunnions, cable, sheaves, and sheave brackets. Cutting width of the blade is 11 feet 11 inches. It is 45¼ inches high. Maximum lift above ground at the center point of the blade is 47½ inches; 54¾ inches at the end points. The limit of blade-pitch adjustment is 10 degrees, and the maximum blade-tilting adjustment is 16 inches.

The 8U has a box-type moldboard construction, 1-inch steel cutting edge, and heat-treated carbon-steel end bits. It may be operated with the Caterpillar No. 24 front single-drum cable control or the No. 25 rear double-drum cable control. It is designed for long-haul pushing of loose material with minimum end spillage, and may be used for stockpiling, handling large-capacity loads, backfilling, pioneering, and sidehill work.

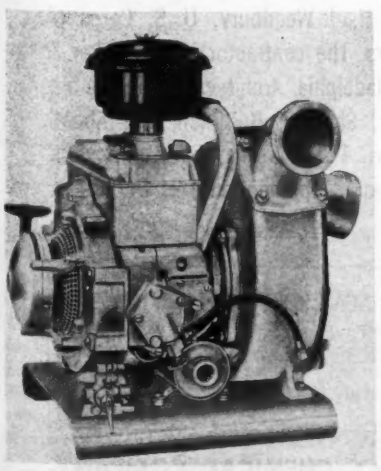
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 83.

New Portable Pump Delivers 15,000 GPH

The Model 15-M self-priming portable pump manufactured by McCulloch Motors Corp., 6101 W. Century Blvd., Los Angeles 45, Calif., is rated at 15,000-gph output. Its 57-pound weight is said to be about half that of pumps with a similar capacity. Powered by a 5-hp gasoline engine, the pump is a centrifugal type with a 28-foot suction lift. It has a nonclogging impeller mounted directly on the engine shaft.

The pump and engine are mounted on a special spring base to provide good footing on all types of terrain. A center balance handle makes it easy to carry; and it is equipped with a kickproof automatic-rewind starter, a rainproof ignition system, and an automatic governor which controls its speed at all loads, McCulloch says. The entire unit is lubricated by oil added to the fuel. A three-way valve permits the use of a separate fuel tank when the pump is to operate for a long time unattended.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 84.



The output of the McCulloch 15-M self-priming centrifugal pump is 15,000 gph. It weighs 57 pounds.

Tilting-Top Trailers In Capacities to 10 Tons

A 4-page catalog on tilting-top trailers with capacities ranging from 2 to 10 tons has been offered by Ray Miller Research Engineers, 727 W. Burnham St., Milwaukee 4, Wis. These units feature all-steel electrically welded frames and Budd dual wheels. The optional 2-way hydraulic cylinder operates during loading or unloading, and is designed to remove all shock to the trailer and tow truck.

The Model B Tilt Top, largest unit illustrated in the folder, has a 12-inch formed-channel frame with five cross members. Optional equipment on this 10-ton-capacity unit includes a 2-speed winch, electric brakes, jack stand, and hydraulic cylinder. The Model B may be obtained with an 8 x 14-foot or 8 x 16-foot platform. Both have 2-inch oak decks with the side edges of the platform supported by the steel framework. All units featured in the catalog are fully described.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 98.

Batt Heads ECA in Britain

William L. Batt, Sr., President of SKF Industries, Inc., Philadelphia, and former Vice Chairman of the War Production Board, has been appointed Chief of the Economic Cooperation Administration mission to the United Kingdom. He succeeds W. John Kenney, who retired November 1 to reenter the private practice of law.

STA-VIS STARTING FLUID

AUXILIARY FUEL FOR QUICK STARTING OF DIESEL ENGINES

- Prolongs battery life
- Sure fire starts
- Saves time and money
- Economical—price reduced

LARGE 24-OUNCE CAN ONLY $1.20 25-can case shipped prepaid

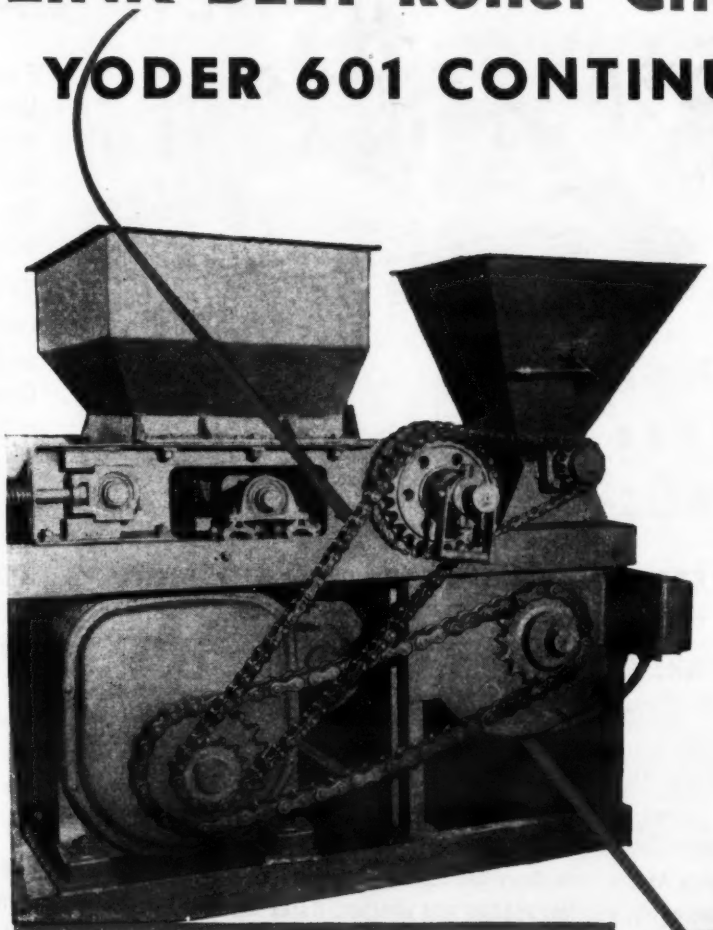
Distributor Territories Open—Write for information

STA-VIS OIL COMPANY. St. Paul 1, Minn.

FASTER, BETTER MIXING with

LINK-BELT Roller Chain Equipped

YODER 601 CONTINUOUS MIXER



Low first cost, reduced operating and maintenance cost, accurate proportioning and positive feed are a few of the advantages claimed for the Yoder 601 mixer, which are made possible by the use of Link-Belt Precision Steel roller chains.

Link-Belt Precision Steel roller chain drives absorb but do not transmit shock. They are strong compared with their light weight and compactness.

YODER 601 CONTINUOUS CONCRETE MIXER

Yoder 601 Continuous Concrete Mixer uses three Link-Belt Precision Steel roller chain drives which provide positive, smooth rotating action.

Link-Belt chains and sprockets are made for each other. Best results are obtained when Link-Belt chains operate on Link-Belt sprockets. A Link-Belt engineer is near you to serve you.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Johannesburg. Offices in Principal Cities. 12,033

LINK-BELT *Precision Steel* **ROLLER CHAINS AND SPROCKETS**

Twin-City Airport Increases Capacity

Contractors Grade and Pave New Runways and Connecting Taxiways to Make Possible Future Dual Landings

✦ TWO THOUSAND feet over Wold-Chamberlain Airport at Minneapolis, a stacked-up Boeing Stratocruiser roared in a circle. Down on the NW-SE warmup apron, a DC-6 stood waiting at the runway, its propellers whirling.

As the big airliners waited out the curse of current airport problems—mushrooming air traffic—a small Beechcraft Bonanza coasted in like a mallard duck, and plopped down on the wide 6,500-foot strip of concrete.

"Oh man!" crackled a sarcastic voice over the tower communications system. "A million dollars waitin' on a dime!"

It made little difference whether that voice came from the ground or above. It merely pinpointed the headache that the Metropolitan Airports Commission at the Twin Cities had suffered ever since airline traffic, winter and summer, had increased alarmingly. What wouldn't the Commission have given to have say two parallel runways, so dual landings would have been possible?

By the end of the 1950 construction season, that wish is likely to be a reality. Grading, paving, and electrical work for a new lighting system has for more than a year made Wold-Chamberlain a busy air terminal.

They are building a completely new NW-SE runway 200 feet wide and 6,500 feet long, to run parallel to the one now existing. The NE-SW runway is getting an 866-foot extension to make it 6,500 feet long. There are new taxiways being built along one side of the new NW-SE runway. Other taxiways and connections are being made also. Last year the N-S runway was extended to 6,500 feet.

Wold-Chamberlain will not be completely finished even after the current major expansion is done. Future plans include another N-S runway when traffic justifies it. Military flying, commercial airlines, unscheduled flights, and private planes may hasten that day.

Unique Design

Several things about the new work are unique. For the first time on a major northern airport, according to Resident Engineer R. B. Hansen, of Toltz, King & Day, Inc., Engineers and Architects, a unique drain system has been designed to remove melted snow, ice, and rain in a hurry. It consists of 25-foot-wide drain strips, paved with asphaltic concrete, along the runway edges of the new work. The drain strips have a 4½-inch inverted-V slope, and are perfectly safe if a plane should have to cross this area. Runoff water will drop through grilled inlets to an underground drain system, and be removed.

The main runways are being paved with 9-inch plain concrete, while the taxiways and runway ends, which bear a heavier load, are 11-inch. Since planes rarely use the edge of a runway, designers reduced the pavement thickness

(*Continued on next page*)

C. & E. M. Photos

Two Terra Cobras (top) pick up loads of dirt on the Wold-Chamberlain Airport with the help of an International TD-24 and a Caterpillar D8. A Hyster Grid Roller (bottom) pulled by an Oliver tractor compacts earth for a new taxiway.

HOOKS, TONGS GRIPS and SLINGS

HANDLE HEAVY OBJECTS SAFELY!

A Downs "Grab" eases every contractor's pulling or handling job. Get Downs pile driving and pulling units, ripping hooks, beam tongs, slings and hooks for odd shaped objects. Write for illustrated catalog No. 200B.

DOWNS CRANE & HOIST CO.
540 W. VERNON AVENUE
LOS ANGELES 37, CALIF.

Electric Cranes • Hand Cranes • Jib Cranes • Sheaves • Sheave Blocks
Plate Grips • Plate Hooks • Crane Trolley Hoists • Crane Wheels • Crane End Truck Units • Jib Crane Fittings • Automatic Mechanical Load Brake Crane Hook Blocks

Darex AEA CONCRETE IN NEW VA HOSPITAL

VETERANS ADMINISTRATION HOSPITAL
BOSTON, MASSACHUSETTS · 1000 BED · G. M.

Pouring began June 1st on the 1000-bed Veterans Administration Hospital in Boston, Mass. The finished project will require 26,000 cubic yards of concrete, all of it Darex AEA concrete except for a few initial pours.

EXTREMELY LOW SLUMP CONCRETE

Concrete is batched, with Darex AEA added at the ready-mix plant of J. P. O'Connell Company, Boston. An unusually low slump of 3½" maximum is being used for the intricately reinforced structure. Air content is 3-4%, Acme Air Meters are used on the job.

HIGH COMPRESSIVE STRENGTHS

Test cylinders for 7 and 28 day compressive strengths are cast daily. While 3600 lb./sq. in. is specified, the Darex AEA concrete is consistently averaging 4300 lb./sq. in. with a cement content of only 5¾ sacks per cubic yard.

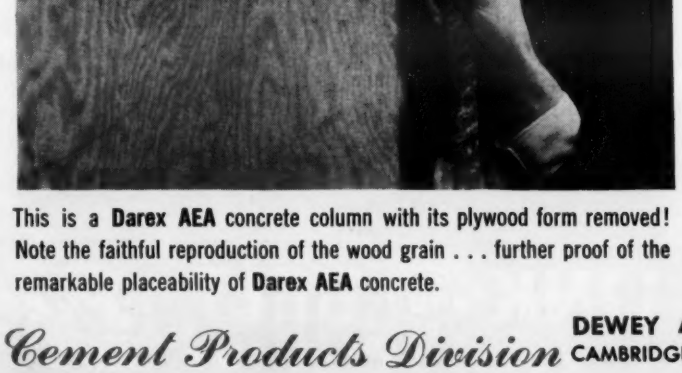
TO COST 13 MILLION

The 14-story structure will have 2 basements and 3 penthouses, with a separate 5-story building for staff and nurses quarters. Construction is under the supervision of Col. H. J. Woodbury, U. S. Corps of Engineers. The contractor is McCloskey & Co., Philadelphia. Architects-Engineers are Coolidge, Shepley, Bullfinch and Abbot, and Chas. T. Main, Inc., both of Boston. Scheduled completion date is December, 1951.

DAREX AEA INCREASES PLASTICITY

Darex AEA concrete flows into heavily reinforced forms and around steel more easily, with less spading and vibration. **Darex AEA** prevents segregation and bleeding, eliminates gravel pockets and sand streaking.

DAREX AEA IMPROVES SURFACE TEXTURE



This is a **Darex AEA** concrete column with its plywood form removed! Note the faithful reproduction of the wood grain . . . further proof of the remarkable placeability of **Darex AEA** concrete.

Darex AEA is in use everywhere on every type of concrete construction . . . and in ready mix and concrete products plants using every known type of aggregate.

Cement Products Division DEWEY AND ALMY CHEMICAL COMPANY, CAMBRIDGE 40, MASS. CHICAGO 38 MONTREAL 32

in the "infrequent use" areas, such as the outer 50-foot strips, to a thickness of 8 inches.

Grading for the new runway strips is 500 feet wide, with 20 to 1 backslopes which blend into the general drainage pattern.

Million-Dollar Grading

In August, 1949, the Commission awarded its first major contract for the present expansion. Dan Borre of St. Paul was the low bidder on a job that, with extras, will cost approximately $900,000. This contract included grading, topsoil replacement, and drainage.

Borre retained the drainage work for its own forces, but grading was sublet to a joint-venture firm: Rohr Co., Inc., and Fred E. Tripp. Grading costs were approximately 50 per cent of the total Borre contract.

Grading got under way on August 27, when the first batch of equipment moved in. The first equipment group consisted of 4 Wooldridge Terra Cobras and 5 Heil, LeTourneau, Gar Wood, and LaPlant-Choate scrapers. The scrapers were pulled by D8's, and later on two HD-19 Allis-Chalmers tractors, two HD-14's, and a TD-24 International were added.

As soon as the first unit had opened up the area, 3 more Terra Cobras, 3 more scrapers, 4 push cats, and a dozer joined the parade. Two Caterpillar motor graders and 15 sheepsfoot-roller units were put to work.

Average grading hauls were long, at least 3,000 feet. Specifications required 95 per cent Modified-AASHO densities. The material was mostly sandy, and its optimum moisture content for compaction was 11 per cent. Sheepsfoot rollers had to make about 8 single passes to develop the proper density.

A Hyster Grid Roller was then purchased. It worked especially well in the granular material. Densities began to climb slowly, and before long the technicians began to report 97, 99, and even 100 per cent results.

The dirt lifts were processed generally about 8 inches deep. Water was available at the field, and tank sprinklers hauled it to the fill. Work was in high gear during the fall of 1949, and the month of October saw 540,000 cubic yards of the 1,600,000-yard total placed and processed. Two 8-hour shifts, 6 days a week, were worked.

Unusually close grading tolerances were also required. Surveyors set reference stakes on 25 x 50-foot centers, and motor graders dressed the finished grade to within ⅜ inch in 10 feet.

One of the toughest problems on the grading end was a large swamp near the center of the field. The mucky soil had to be removed and sandy backfill placed at the same time. It was not easy.

Three ¾-yard draglines—a Northwest, an American, and a Byers—moved into the swamp on heavy mats. They worked around the outside perimeter, taking a cut as far as they could reach. This material was loaded into 22 dump trucks and spoiled in waste areas. As fast as the machines would make a cut, other equipment was bringing in fill and processing it. This method made it possible for the dump trucks to operate on solid ground at all times.

By working a strip around the swamp, then moving the draglines toward the swamp center to repeat on another strip, the entire swamp was removed and replaced with good material.

Groves Gets Paving

When the Commission called for bids on the concrete paving, S. J. Groves & Sons Co. of Minneapolis was the low bidder at $1,100,000. Paving, too, was especially full of problems. Timing was of vital importance, since grading and some lighting operations had to be completed before the paving could begin.

(*Continued on next page*)

C. & E. M. Photo

From the finishing end, concrete-paving operations at the Minneapolis-St. Paul international airport look well strung out.

OUTSTANDING MECHANICAL EXCELLENCE

. . . . . marks every Chrysler Industrial Engine

Completely Waterproofed Ignition

All Friction Surfaces Superfinished

Sodium Cooled Exhaust Valves

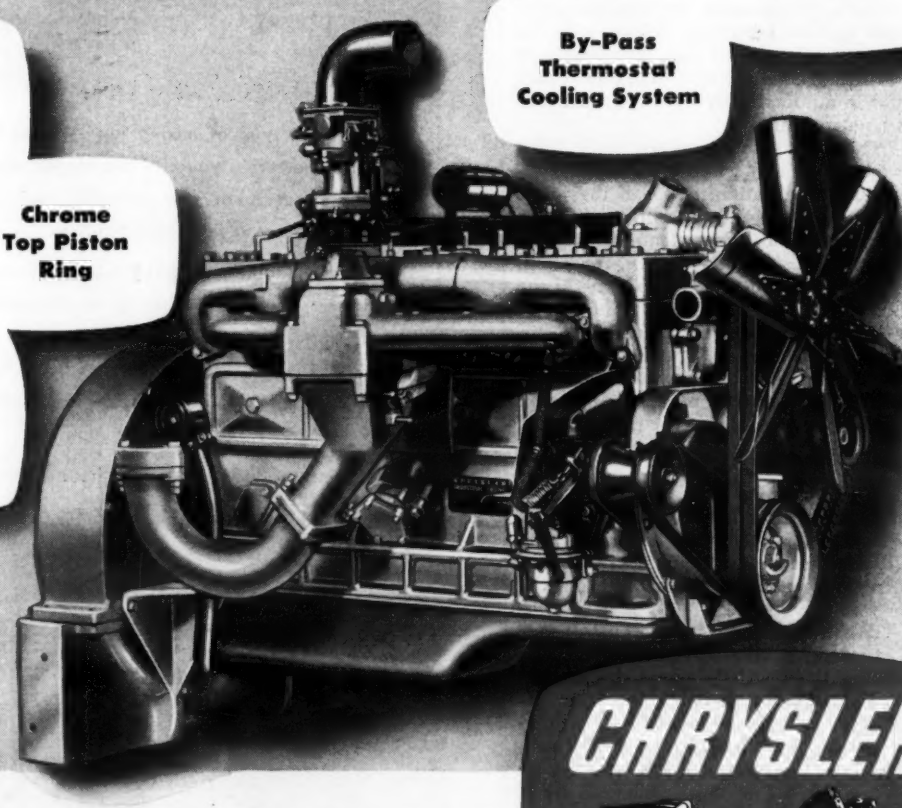
Statically and Dynamically Balanced Crankshaft

By-Pass Thermostat Cooling System

Stainless Steel Valve Springs

Chrome Top Piston Ring

Stellite Exhaust Valve Seat Inserts



Chrysler Industrial 12 — one of eight basic models

CHRYSLER

HORSEPOWER WITH A PEDIGREE

Built to operate at high speeds— deliver better performance and more power for less money!

The proof is plain for all to see! *Higher speed engines have been proved superior on every type of gasoline powered industrial equipment.* Chrysler, first to develop higher speed engines, has consistently led the advance with a continual parade of new engineering improvements.

On every type of job requiring industrial power, Chrysler high speed engines have out-performed, out-lasted and out-economized all similarly rated engines. Today, more equipment is being powered by Chrysler Industrial Engines than ever before. And the trend is continuing at an accelerated rate.

The reasons are particularly significant. May we tell you about them? See your Chrysler Industrial Engine Dealer or write us. *Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.*

Twin-City Airport Increases Capacity

(*Continued from preceding page*)

As a result, frequent visits between Groves' General Superintendent P. F. Huntington and Grading General Superintendent Jack Rucker were the rule. Both men worked hard to arrive at the proper compromises which would let both outfits operate to the best advantage. Once grading was out of the way, lighting systems installed by Reliable Electric Co. went in rapidly.

Since grading had been done to such fine tolerance, it was not necessary for the paving contractor to use elaborate fine-grading equipment. A tail blade dragged by a Caterpillar No. 12 motor grader cut out any excess dirt, which was promptly moved out of the way by a Scoopmobile loader. The grade was checked by a string line and rolled smooth by a 10-ton steel-wheel roller.

Groves used 7,000 feet of Blaw-Knox and Heltzel forms, which were set ahead of the paver about 1,500 feet. The form trench was excavated either by a motor grader or by hand labor. The forms were hand-tamped.

The 11-inch thickness of concrete was made by fastening a 2-inch board to the base of the 9-inch steel forms. A sequence of preparation was followed to let poured lanes set 7 days before paving equipment could use the edges. In general, a 25-foot edge lane was poured first. Alternates were then poured until the far side of the runway had been reached. Then the machines moved back to pick up the remaining lanes.

Paving Joints

Since the Minneapolis airport is subject to extremes of climate, ample paving joints were required. Expansion joints, with ¾-inch asphaltic mastic and 1 and 1¼-inch dowels at 12 and 15-inch centers, respectively, were placed every 400 feet. Contraction joints were at 20-foot intervals, and consisted of formed grooves, with 1-inch dowel bars put in automatically by a Heltzel Flex-Plane machine.

The joint grooves were later filled with a special rubber-asphalt joint-sealing preparation. Some of the joints filled with dust before this could be done, and a Tennant cleaning machine was used to good advantage. A Concut saw also helped to open up some of the bad joints.

Paving was done by a Koehring 34-E Twinbatch machine. It was spotted between forms. Mixing water came by two tank trucks from a standpipe on the airport, and the paver pump picked up its supply from a tank constantly with the machine.

Concrete from the paver dropped to the grade in front of a Blaw-Knox concrete spreader, with a surface tube vibrator. This machine evened the mixture between forms and put on the necessary vibration.

The first finish was made by a Jaeger Lakewood double-screed finisher. Following this machine came the Heltzel steel-installation machine, which vibrated the transverse and longitudinal steel bars into the center of the slab. The final mechanical finish was put on by a Koehring machine. One man drove the metal center-joint wedges from the back of the machine.

Two men then began the manual floating. Long-handled straightedges were used first; then a pulled-belt finish went on. Three men working from a bridge then pulled the metal joint wedges slightly, and finished the concrete lines with edging tools. After the concrete hardened enough so the metal wedges could be removed entirely and brought ahead, the concrete was cured for 96 hours by paper rolls, laid flat and held down by dirt.

The best day's run was 1,380 feet in 9½ hours. Half of this footage was 11-inch; half was 9.

C. & E. M. Photo
Resident Engineer R. B. Hansen (left) and his concrete inspector Earl Barney hold a conference near the Heltzel dowel-steel machine.

Forms were pulled by removing the pins with mechanical extractors. A small winch truck then loaded the sections on a truck, and they were moved ahead for the next pour.

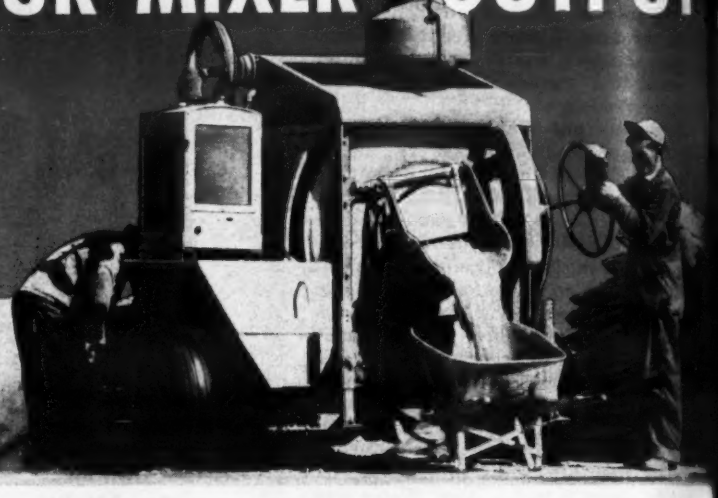
The job was ideal from a batching standpoint. There was plenty of space on the field for a batch plant, so a Butler 3-bin aggregate plant and a Blaw-Knox 300-barrel cement unit were set up. Sand, pea gravel, and ¾ to 1½-inch rock was trucked in from Industrial Aggregate Co. in North Minneapolis. A Lorain 1½-yard clam moved it from the stockpiles to the bins, while a D7-mounted dozer kept the separate materials piled.

Dewey, Northwestern, and Lehigh bulk cements were used. They arrived by rail, were unloaded at Fort Snelling on a Milwaukee Railroad siding, and transferred to the cement plant in special covered tight-body trucks. For a time air-entraining cement was tried, but due to the necessity of using several brands of cement the entrained air fluctuated too widely, according to Resident Engineer Hansen, to be acceptable. For most of the job AirCrete air-entraining agent was used at the paver. Batch trucks usually numbered from 8 to 10, and one truck was always in reserve in case it should be needed.

The entire undertaking, from start

(*Concluded on next page*)

STEP UP YOUR MIXER OUTPUT *with* KWIK-MIX



11-S Dandie, illustrated, is a 2-wheel, end-discharge non-tilter . . . also available as a 4-wheel mixer with side or end discharge. Note tilted Flow-Line chute for faster discharge of each batch.

ON EVERY type of mixing job — concrete, bituminous or plaster-mortar — you can get bigger production, more profit for your labor and materials costs with Kwik-Mix mixers. Here are a few reasons why:

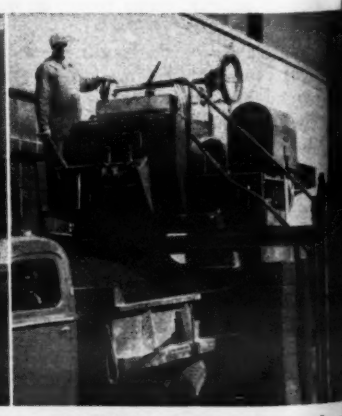
Through the double-mixing action of Kwik-Mix Dandie, you get perfect texture concrete at no increase in batching time or cost. Exclusive Flow-Line discharge chute reaches deep into drum . . . discharges each batch fast. Four Dandie sizes range from 3½ to 16 cu. ft. capacities, with wide choice of side or end discharge types.

For biggest production per man-hour on your bituminous work, it will pay you to check the 10 and 14 cu. ft. Kwik-Mix bituminous models . . . easy loading . . . accurate, thorough mixing . . . fast discharging. For your plaster work, there are 6 and 10 cu. ft. Plaster-Mortar mixers that easily keep ahead of the fastest men on any job.

Every model in the big Kwik-Mix line has silent, smooth-running "V"-belt drive . . . easily adjustable, accessible . . . delivers steady, trouble-free production. Whatever your mixer requirements, you'll find Kwik-Mix the lowest cost answer. Call your local Kwik-Mix distributor for complete facts . . . or write TODAY.

3-1/2-S Dandie; side or end discharge; tilting or non-tilting. Sturdy . . . light weight . . . portable.

6-S Dandie; end discharge; non-tilting. Also shown is 4 h. p. Moto-Bug — a versatile power wheelbarrow.



BITUMINOUS mixers; 10 and 14 cu. ft.; tilting; 4-wheel; also ideal as high production stationary plant. 10 cu. ft. model

Send to: KWIK-MIX CO., Dept. CE, Port Washington, Wis.
Please mail bulletins on: Dandie* Mixers ☐ 3½-S ☐ 6-S ☐ 11-S ☐ 16-S
Bituminous Mixers ☐ No. 10 ☐ No. 14 Plaster-Mortar Mixers ☐ 6-P ☐ 10-P
NAME _____ TITLE _____
COMPANY _____
STREET _____
CITY _____ STATE _____
☐ Also send facts on new 4 h. p., 10 cu. ft. Moto Bug power wheelbarrow.

KWIK-MIX
Port Washington, Wis.
(Koehring Subsidiary)

to finish, was big and hazardous. Wold-Chamberlain is a busy field; planes roared in endlessly. Flagmen covering the crossings of batch trucks at the landing ends of runways had a full-time job. Clearance to active runways was maintained by means of a high-frequency 2-way radio in a contractor's car, which was in direct communication with the control tower. The radio car operator directed flagmen in controlling construction traffic, as advised by the tower.

New Snowplow Bulletin

A 6-page bulletin covering the complete Baker line of snowplows for all Allis-Chalmers tractors and motor graders has been announced by The Baker Mfg. Co., Springfield, Ill. Construction details, application recommendations, and complete specifications are contained in Bulletin No. 890.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 69.

A Protex precast headwall is lowered for attachment to a culvert pipe near Berthoud Pass, Colo. Installation was completed in 7 minutes by two men. The new headwall fits both concrete and corrugated pipe, regardless of skew or angle.

Precast Headwalls Offer Many Features

Precast-concrete headwalls have recently been put into commercial production by Protex Industries, P. O. Box 4044, South Denver Station, Denver, Colo., manufacturer of Protex air-entraining agent. The headwalls save time, says Protex, since many of them can be cast and inspected at one time in the manufacturer's plant. The per-yard price for concrete in headwalls is eliminated, since the new headwalls are priced per unit. For this reason, the company claims, the contractor can make a profit on each headwall that he places and avoid the problem of building forms and of hauling aggregate and sand many miles to make a small pour. The cost, Protex says, is considerably less than the pouring of any headwall today.

The new development resulted from the discovery that by using Class A Protex air-entrained concrete instead of Class B, weight was reduced almost half in every size of headwall. The new precast headwall is designed to fit as though cast on the job, regardless of the angle or skew of the corrugated-metal or concrete pipe. The pipe is first set to the headwall. The engineer then provides the degree or angle of cut, after which the pipe is cut to fit. Special patented lug bolts hold the pipe in place during the grouting process. Grouting is handled in a few minutes with the use of a special grouting board, according to the manufacturer.

The concrete is reinforced with a ring of steel rods and wire mesh. All headwalls necessary for a project can be loaded on a truck and distributed along the road by a crane. They can be installed with or without a foundation base, with one wing wall, two wing walls, or without any wing walls.

Precast-concrete-products manufacturers throughout the United States will be franchised to manufacture the new patented headwall. Manufacturing rights are still available in many areas and can be secured by contacting Protex Industries.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 28.

Antifreeze Improved With Rust Inhibitor

Addition of a new type of rust-inhibiting chemical to the alcohol-type antifreeze Freez-Rem has been announced by Speco, Inc., 7308 Associate Ave., Cleveland 9, Ohio. Speconite, it is said, will prevent rust and corrosion of metals in engine cooling systems and will not damage rubber hose or hose connections. Freez-Rem is available in 1-gallon cans, 5-gallon pails, and 54-gallon drums.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 29.

Articles on Cost Cutting

The first of a series of three articles on "Cutting Construction Costs", showing contractors how their jobs can be more efficient through proper layout, and pointing out to operators how they can help keep construction costs down by employing short cuts and improvements in operation, is featured in the August-September issue of the "Co-Operator", prepared by R. G. LeTourneau, Inc., Peoria, Ill.

Another article of interest to the construction industry describes and illustrates recommended methods of attaching wire-rope seizings and sockets. A checklist covering maintenance intervals on LeTourneau electric-controlled equipment is also included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 56.

NEW TOWER LOADER for Kwik-Mix 11-S and 16-S

Now you can discharge concrete batches to forms above ground level, or direct into trucks with handy Kwik-Mix Tower Loader attachment. Fits 11-S and 16-S Dandie mixers . . . discharges at 9'2" height. Big bucket holds full batch . . . is raised by power . . . dumps automatically when it reaches top of tower. Mixer engine supplies the power. Single-lever operated from mixer platform. Saves you the time and cost of overhead mixer installations on many jobs.

PLASTER-MORTAR mixers; 6 cu. ft.; non-tilt; 7-second discharge; efficiently serves 1 to 30 plasterers. 10 cu. ft. size also available.

-MIX COMPANY

Big Capacity 310 TRENCHLINER®

Where you need extra range of digging widths and depths, check this big 310 Trenchliner. Digs to 17' deep at widths from 1½ to 4½'. Dual booms on extra-wide carriage cuts trenches up to 6' wide, at 11' depth. Selection of 45 digging feeds, from 8" to 15½' per min., assures maximum digging efficiency. See your Parsons distributor for more facts, or write for new catalog.

PARSONS COMPANY
Newton, Iowa
(Koehring Subsidiary)

Big-Storage LO-BIN TROLLEY BATCHER

For big storage capacity and exceptionally low charging height. Available in 8, 20 or 30 ton capacities, in 7½', 8'8" and 9½' heights respectively. Furnished with 2, 3 or 4 compartments and up to 4 weigh beams. 22 cu. ft. weigh hopper is cantilevered, dumps directly into mixer skip. Efficiently serves 6-S, 11-S and 16-S Mixers. Optional mounting: wheels, pneumatic tires, tow-bar.

C. S. JOHNSON COMPANY
Champaign, Illinois
(Koehring Subsidiary)

Koehring 205 handles 7-3/4 to 10-ton lifts

As a lift crane, Koehring heavy-duty 205 safely handles 7¾ to 10-ton loads, depending on type of mounting. Available on crawlers or rubber-tires. Its fast line speeds also give you big production on clamshell or dragline work. Readily converts to ½-yard shovel or hoe. See your local Koehring distributor . . . or get complete story in big 28-page catalog . . . write TODAY.

KOEHRING COMPANY
Milwaukee 10, Wis.

Maintaining Dirt Roads

The Civil Engineering Department of the Allis-Chalmers Tractor Division makes the following suggestions about rural-road maintenance with motor graders. In the first place, it says, the light low-cost tandem-drive motor grader is usually more than adequate for general maintenance work.

In the second place, the primary maintenance problem on dirt roads is to keep a smooth driving surface and at the same time save gravel, maintain the crown, and prevent additional ditches from starting on the shoulders.

The company does not recommend the older method of achieving this, by windrowing gravel and loose material from one side of the road to the other.

A better method, it says, and one which is becoming standard maintenance practice, is to pick the gravel and loose material up from both sides of the road and windrow them to the center in one or more round trips. Then the windrow can be spread back toward the sides in one pass by setting the blade straight across, or it can be spread by making another round trip casting half of the windrow to either side. The operator is thus able to keep the desired crown and to distribute the loose material evenly on both sides of the road.

In order to keep berms lower than the driving surface, it is often necessary to cut the berm down with the motor grader and remove the material with trucks. If the berm is to be cut away it is advisable to move any gravel away from the shoulder before cutting the sod away. Often operators cut too much material from the berm and leave a ridge of sod or dirt on the edge of the shoulder. This causes poor drainage from the road surface and consequent damage to the surface.

Roads which become hard during the hot, dry, summer months should be maintained after rain storms or during damp weather when the dirt is in a workable condition, Allis-Chalmers suggests. Hard surfaces may require a scarifier application before satisfactory blading is possible.

Surface maintenance is one of the primary purposes of the motor grader, and the light low-cost tandem-drive motor graders are more than adequate for general maintenance work, says Allis-Chalmers.

Auto Figures Released

Several records were broken by the automotive industry of the United States in 1949, according to the 30th edition of "Automobile Facts and Figures", a yearbook published by the Automobile Manufacturers Association, New Center Bldg., Detroit 2, Mich. Production of passenger cars; registration of passenger cars, trucks, and buses; gasoline consumption; motor-vehicle mileage; and aggregate motor-vehicle user taxes, hit new highs last year.

Automotive sales currently account for better than 20 per cent of all U. S. retail trade, according to Oscar P. Pearson, chief AMA statistician. More than 435,000 business concerns have been created to take care of this volume.

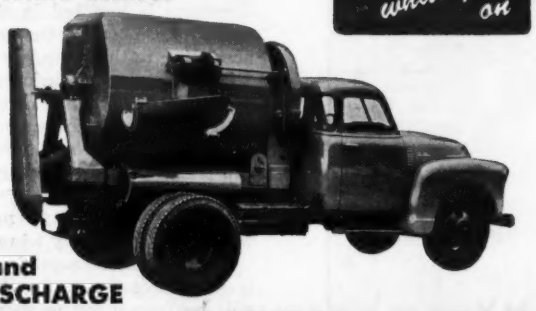
Progress in highway safety, says the yearbook, is reflected in the fact that highway traffic fatalities per vehicle in use and per vehicle-mile driven in 1949 were the lowest since figures have been recorded.

Facts and figures covering every phase of the automobile industry have been collected for the yearbook, which is available gratis from the Association upon request.

Faster charging, due to open top stationary drum

Mixing while loading with visible control

"You see what goes on"



REAR and SIDE DISCHARGE reduces delay on arrival at job.

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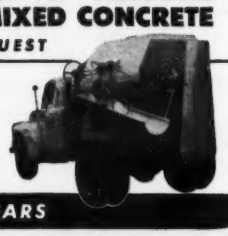

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electric pre-heater... for Gas and Diesel Engines

Advantages of KIM operation:

- ✔ *Gives quick, easy starts*
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- ✔ *Prolongs life of batteries*
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It's this simple—equip your cars and trucks with KIM Hotstarts and you end major worries of winter operation. Engines purr like kittens. Starting is fast, smooth. You don't use as much fuel and you spend less on repair bills. All told, there are so many advantages that we say, without hesitation, KIM is the best wintertime investment that you can make.

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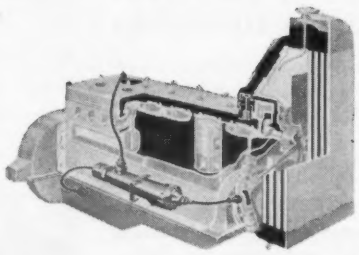
Many of the smartest fleet operators in the country know KIM, use KIM, like KIM. Why don't you profit from their experience? Sold and installed by International Truck and Mack Truck dealers and by leading automotive suppliers. See them for information or use the coupon.



KIM HOTSTART MFG. CO.
West 917 Broadway, Spokane 11, Wash.
Please send literature, prices, name of local KIM dealer

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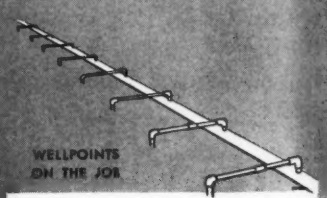
Company_____

Address_____

City_____ Zone____ State_____

dewater the Complete way



Pre-drainage with Complete Wellpoint Systems prevents trouble wherever subgrade water is a problem. By eliminating the water hazard, you usually eliminate any need for sheeting — you often are able to continue operations even in sub-zero weather — you frequently can use equipment which "wet grounds" would rule out—and you always can count on completion in scheduled time at scheduled costs!

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FOR SALE OR RENT

The Buda Model HBQ hydraulically controlled earth drill opens 6 to 42-inch-diameter holes to a depth of 8, 10, 12, 14, or 16 feet.

Truck-Mounted Drill Opens 42-Inch Holes

A new earth drill designed to auger 6 to 42-inch-diameter holes to a maximum depth of 16 feet has been announced by the Buda Co., Harvey, Ill. This Model HBQ drill may be powered by a 4-cylinder Buda industrial gasoline engine or a comparably rated diesel engine.

Hydraulic controls on the new unit raise or lower the tower from traveling position, plumb it 15 degrees fore or aft, and adjust it 45 degrees to the right or left of vertical position for drilling angle holes. These controls also feed the helix into the ground and augment the mechanical power for lifting dirt and helix from the hole, Buda says.

Features of the Model HBQ include opposed power-feed cylinders with chromium-plated rams, clutch interlock system, one reverse and four forward speeds, and an automatic clutch throwout which stops drive rotation when the tower is folded down and starts rotation when the tower is raised for operation. The entire unit is base-mounted on a structural I-beam frame, with lifting eyes so that the drilling unit may be removed from the transporting vehicle if required. Optional features include a remote transmission and clutch shift located within the operator's reach, and a pole-setter tower extension and head sheave with a quick-reverse winch for setting poles up to 60 feet in length.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 73.

Motor Speed Control For Power Takeoffs

A new device to control motor speed automatically when operating truck equipment with a power takeoff or its equivalent has been developed by the Stratton Equipment Co. of Cleveland, Ohio, and is available through the Truckstell Corp., Union Commerce Bldg., Cleveland, Ohio. It is said to improve the operation of dump trucks, tailgate loaders, Stratton Hydro-Loaders, and other equipment, and to effect economy by reducing motor wear and tear.

The unit may be installed without special tools on all trucks that are equipped with hydraulically operated devices deriving their power from a power-takeoff source on a transmission or separate power pack. It may be installed on the engine at any location permitting unobstructed linkage to the accelerator lever on the carburetor. Actuating linkage is a simple non-kink bead chain.

The principle of the Stratton Hydro-Throttle control is as follows: pressure from the power-takeoff pump, or equivalent, automatically actuates the piston in the Hydro-Throttle control; thus, as pressure from the power source increases to lift a load, the piston is forced into action to speed the engine to the proper rpm. As the load is stopped, or the pressure reduced due to varying conditions, the throttle instantly and automatically returns the engine to idling speed. This, the company points out, eliminates unnecessary racing of the motor. The valve is pre-adjusted at installation so that no higher motor speed than is actually required is produced for any load being handled.

Further information may be secured from Truckstell Corp. Or use the Request Card at page 16. Circle No. 78.

Corrosion-Resistant Cements

A new bulletin, No. 5-1, on corrosion-resistant cements has been prepared by The Atlas Mineral Products Co., 43 Walnut St., Mertztown, Pa. It describes the complete Atlas line of resin, sulfur, silicate, and asphaltic cements. Information on each cement is compiled in handy chart form, designed to be helpful in the selection of the correct cement for a specific application.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 90.

Wigton-Abbott Hires Smythe

James F. Smythe is now contracting engineer for the Wigton-Abbott Corp., Plainfield, N. J. He has held posts with Air Reduction Co. and the Indiana State Highway Commission.

$5.22 a ton for Asphalt
IS WORTH SAVING!

The Foote Kinetic Asphalt Mixer will give you 8 to 10 more batches from a barrel of asphalt. One user* has reported savings of $5.22 a ton. They used to buy their material for $10.50 a ton. Now they make it with the Foote Kinetic Asphalt Mixer for $5.28 a ton. $5.22 a ton is worth saving! Such savings will soon pay for your Foote Kinetic Mixer.

You cannot compare the Foote Mixer with an ordinary concrete mixer either from the standpoint of construction or the finished product. Let us send you complete details. Ask for Bulletin K-100.

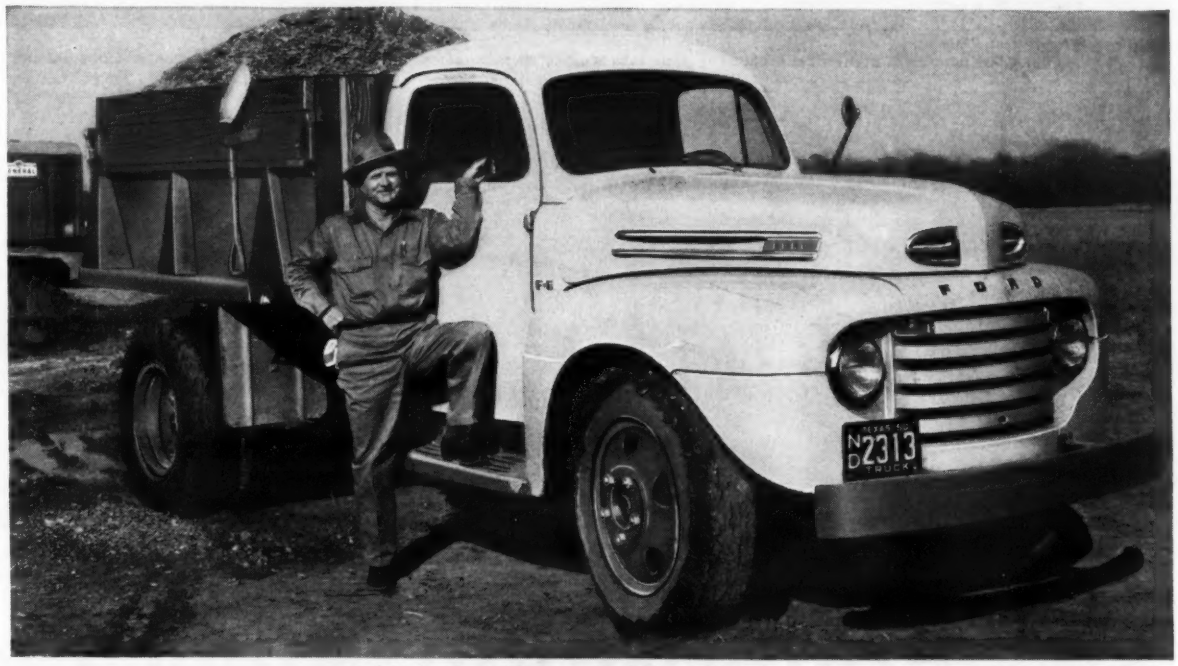
*Name on request.

- 3 cu. ft. in 30 seconds
- High output for low investment
- Handles any mix
- Fully portable
- New mixing principle gives you 8 to 10 more batches out of every barrel of asphalt

the FOOTE Kinetic mixer

THE FOOTE CO., INC.
Subsidiary of Blaw-Knox Co.
1916 State St., Nunda, New York

A BLAW-KNOX PRODUCT



Ford F-6 shown has G.V.W. rating of 16,000 lbs. Over 175 other models available — 95-h.p. Pickups to 145-h.p. Big Jobs.

"I saved about 1½ gallons of gas on a round-trip of 35 miles!" —SAYS J. S. LAIRD
DALLAS, TEXAS

SAVE WITH FORD!
AMERICA'S NO.1 TRUCK VALUE!

★ SAVE GAS with Ford Loadomatic ignition and High Turbulence combustion chambers.

★ SAVE OIL with Ford Flightlight aluminum alloy pistons, cam ground for oil-saving fit at operating temperatures.

★ SAVE WEAR with pressure lubricated main and crankpin bearings, Double Channel frame, extra heavy duty axles, big brakes (up to 16 in. by 5 in.).

★ SAVE ON REPAIRS with demountable brake drums, brake inspection hole, engine-top setting of accessories, plus nationwide service from over 6,400 Ford Dealers.

★ SAVE TIME with Ford reliability and performance. Only Ford gives you a choice of economy-proved V-8 or 6-cylinder truck engines.

"I BOUGHT a Ford Model F-6 powered by a 110-h.p. 6-cylinder engine to replace a 2-ton truck I had operated for two years," says J. S. Laird.

"Hauling the same load—5 tons of pit gravel—over the same roads, the Ford F-6 saved about 1½ gallons of gas on a round-trip of 35 miles. This is the most economical truck I have ever owned."

On big hauling jobs or small, Ford Trucks are turning in standout records for performance, economy and long life. That's why more truck users today are switching to Ford... to make Ford the indisputable leader in sales gains. Join the Big Switch to Ford! Choose from over 175 models—95-h.p. Pickups to 145-h.p. Big Jobs. See your Ford Dealer about the only truck that gives you a power choice of V-8 or Six.

Ford Trucking Costs Less Because—
FORD TRUCKS LAST LONGER
Using latest registration data on 6,592,000 trucks, life insurance experts prove Ford Trucks last longer!

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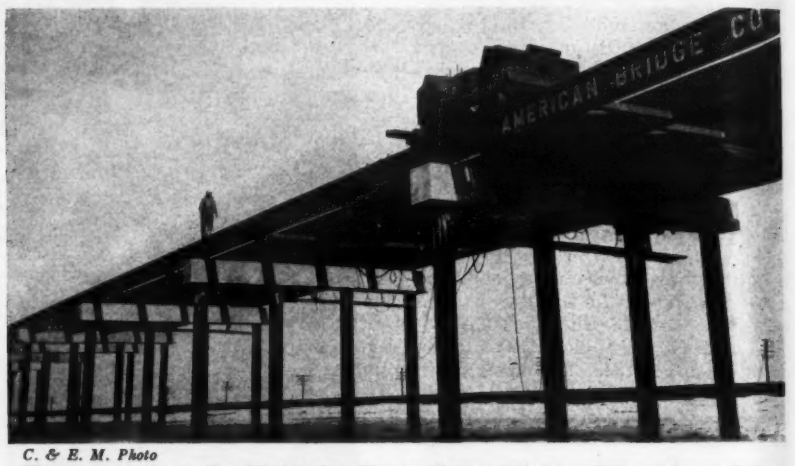
Texas Highway Department Photo

Some 7,000,000 pounds of structural steel have gone into Nueces Bay Causeway. American Bridge Co. fabricated the steel and sent it by barge and tug to Corpus Christi.

C. & E. M. Photo

Austin's barge-mounted P&H crane unloaded the girders and placed them across the caps for welding. Smaller members were placed temporarily on a work barge.



C. & E. M. Photo

The causeway is an all-welded design. Here welders working up off the water on timber platforms tie the heavy girders together, using Lincoln arc machines.

Foundation, Steel, Concreting

Special Rig Drives 115-Foot Monotube Piles to 46-Ton Bearing to Hold Two-Lane Causeway Over Nueces Bay

Structural Assembly Tough On 1.8-Mile-Long Structure Because of Windy Weather And Close Tolerances

By RAYMOND P. DAY,
Western Editor

✦ WORKING from the top with a special pile driver, Austin Bridge Co. of Dallas has finished one of the biggest foundations ever built on the Texas Gulf Coast. Over 90,000 feet of Union Metal Monotube piles, totaling 1,200 pieces, were driven in the $2,457,000 Nueces Bay Causeway contract at Corpus Christi.

Test bents 1,000 feet apart were driven by a floating rig, and spotted by surveys so accurately that the bents checked perfectly later on. In some places the footing was so soft the piles dropped faster than the hammer. In other spots the foundation was hard. In every location the contractor had to calculate the length of pile accurately, to place a certain splice at an elevation of minus 4, or lose money, as will be explained later. It was an interesting and unusual job.

The new causeway replaces a timber structure built in 1919 after the original concrete causeway was destroyed by hurricane. The timber structure, though adequate for the traffic of its day, has become obsolete due to its narrow roadway and low load capacity. Axle loads over 14,000 pounds have been prohibited for some time over it.

In the design of the new 9,636-foot causeway, the grade was raised so that low steel on the I-beam spans is about 21 feet above low tide—and well above any anticipated wave action during hurricanes. In order to minimize possible damage from floating wreckage, a 25-foot simple beam span is inserted between each pair of 200-foot continuous units. The 25-foot span is so designed that if an adjacent 200-foot section should be destroyed, the short span will fall free, thus preventing progressive deterioration of the entire structure.

Floating Rig Drives Test

Preliminary to July 1, 1949, when Austin Bridge Co. moved in, the Texas Highway Department had prepared a work channel 75 feet wide and 6 feet deep parallel to and adjacent to the causeway. The work was done in conjunction with an approach contract. The dredge Ranger dug the cut through a shoal covered generally by less than a foot of water.

A floating rig then moved in to drive ten test bents. It consisted of a 655-B P&H crane with a 100-foot boom, barge-mounted on a 90 x 30-foot steel scow. It was equipped with a set of hanging leads and a Vulcan No. 1 single-action hammer. A boiler furnished steam.

Texas Highway Department surveyors knew they had a tough job on their hands. They had run an offset base line along the top of an oyster-shell dike, but winds and waves soon washed parts of this traverse away. Several bents were driven at locations established by intersecting transits.

(*Continued on page* 42)

✦ A STAGGERING 7,000,000 pounds of structural steel on the Nueces Bay Causeway gave ironworkers the workout of their lives at Corpus Christi, Texas. The $2,457,000 project, 1.8 miles long, is one of the biggest jobs ever done in that region. When the Resident Engineer sent in the February estimate for Austin Bridge Co. of Dallas, the contractor, it was the largest voucher for a month's work ever paid by the Texas Highway Department. It amounted to $317,000, but was second in Austin Bridge Co. annals.

An all-welded design, coupled with practical construction problems, made the work interesting if not downright difficult for the structural men. When the wind blows hard enough to overturn a 4-ton steel girder, men who handle the pieces are bound to have a thrill or two.

Welders who have to stay out ahead of other crews in spite of bad weather have their problems, too, as we shall see.

Bridge Design

Designed for H20-S44 loading, the causeway rests on 4-pile bents on Union Metal Monotubes, driven to 46-ton bearing. (See accompanying article.) These bents are 50 feet apart, with a free 25-foot bent at the end of each 200-foot section. Reinforced-concrete caps cross each bent.

The steel girders consist of two 27-inch 94-pound WF outside sections, and three 30-inch 108-pound WF inside beams. These are spaced to carry the 28-foot roadway deck, with 2 feet 3 inches of curbing cantilevering out beyond the outer beams. The girder members are continuous for 200 feet by means of field welding, and there is a 25-foot free section at the end of each. The causeway has one bascule-type leaf to let small boats pass through.

Shortly after the first World War the old Nueces Bay Causeway was destroyed by wave action resulting from a hurricane. The new causeway is high enough to be safe from wave action, but sections might be destroyed by derelict barges, etc.

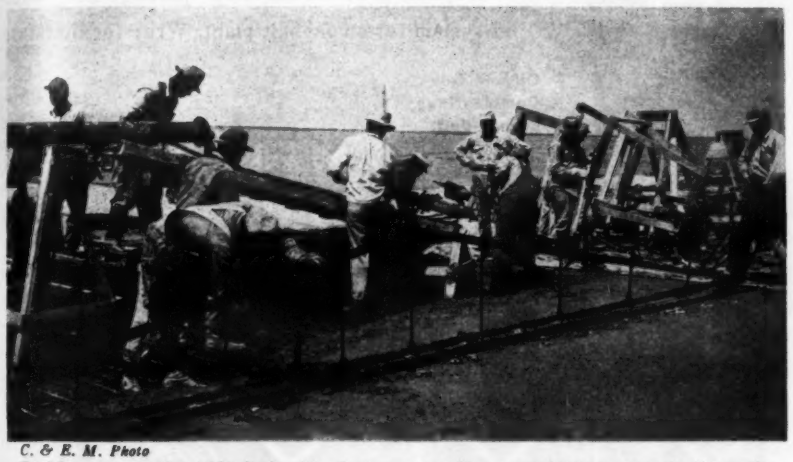
The reinforced-concrete deck, 7 inches thick, rests on top of the steel beams. It has a crown of about ⅛ inch per foot, and will carry two lanes of traffic. The handrail on each side is a metal-pipe oval-type affair, simple but serviceable.

Steel Towed Great Distance

The structural-steel members were fabricated in Ambridge, Pa., by American Bridge Co., and loaded on barges 175 feet long and 26 feet wide. Each barge was loaded strictly according to directions furnished by Austin Bridge

(*Concluded on page* 44)

C. & E. M. Photo
The concreting schedule called for placement of 450 linear feet of 7-inch reinforced-concrete deck a week. Austin used a Rex 160 Pumpcrete and a 7-inch delivery pipe.



C. & E. M. Photo
Looking across the 32½-foot-wide deck we see the crew taking concrete from the delivery pipe. The supplier delivered concrete to the causeway in Moto-Mixers.

C. & E. M. Photo
The concrete is struck off by a pipe screed as other workmen shovel the material. Engine-driven vibrators were used to work it around the steel.

On Causeway at Corpus Christi

Small Lightweight Panels Are Substituted to Let Crews Pour 450 Feet of Causeway Deck Per Week

✦ SMALL 2-man plywood form panels and a special carrier platform were responsible for exceptional speed in concrete work on the new Nueces Bay Causeway at Corpus Christi, Texas. Here, hampered by wind and weather, Austin Bridge Co. of Dallas is building the $2,457,000 structure for the Texas Highway Department.

A weekly pouring schedule called for placement of 450 linear feet of 7-inch reinforced-concrete deck. Since the deck is 32 feet 6 inches wide, including the two 2-foot 3-inch pedestrian curbs, it was an ambitious undertaking. Austin Bridge Co. departed from its usual practice of larger form panels, with a result that the work is going ahead rapidly.

The smaller form panels were set from above but stripped from below by a special carrier. It has two platforms, enabling a small crew to drop the panels and move ahead quickly. The 270-foot carrier rode beneath the causeway deck with room enough to clear the concrete caps.

Small Panels Used

Instead of the usual large prefabricated deck panels which General Superintendent Jack Turquette says "take ten men and a boy" to handle, the size was cut down here to 12½ feet x 17½ inches. Four such panels and a filler strip reached exactly across the space between the steel girders. Built in 12½-foot lengths, they fitted the 25 and 37½-foot concrete pours.

The panels consisted of plywood facing, nailed to 2 x 4 studs. Placed from the top, they handled easily and went in fast. They were adjustable two ways, for a center piece was used between each double row of panels.

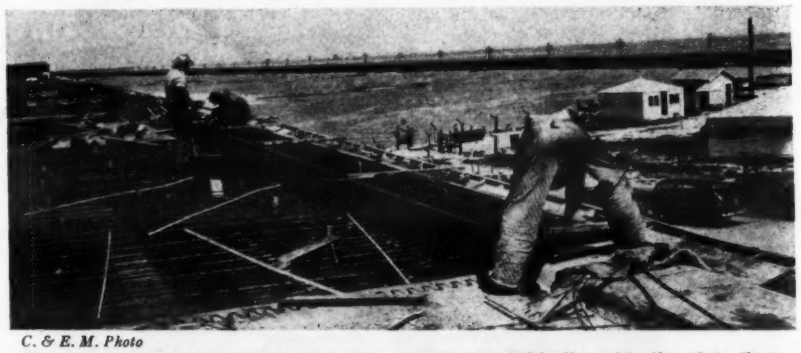
Panels rested on three 2 x 8-inch joists. Each end of the joist fastened to a small screw jack, which rested on the longitudinal steel-beam flange and held the form panel in position. This arrangement also permitted rapid stripping from the carrier underneath, because men had only to unscrew the jacks, remove the joists, and the panels fell down or could be pried loose with ease.

The curb forms also came in small sections. Their construction was generally similar, with the exception that the curved curb-face form was a special shape. The curb was poured monolithically with the slab and cantilevers out beyond the outer girder. Therefore it required external support from underneath.

That support consists of a structural-steel brace which bolts to the girder steel. Jacks from this steel brace reach up from underneath and support the curb forms.

The special carrier which stripped these forms is a long, narrow, 270-foot frame with a 2-drum Jaeger hoist in

(*Concluded on page* 45)



C. & E. M. Photo
The 2-foot 3-inch pedestrian curb was poured monolithically with the slab (here carpenters are installing the forms). It cantilevers beyond the outer girder.

C. & E. M. Photo
Here you can see the steel braces and jacks which support the curb, and the special carrier which rolled along under the causeway for stripping the forms.

Texas Highway Department Photo
Surveyors used ingenuity to rig up this transit support to fit a test pile for the Nueces Bay Causeway.

Piles for Causeway Driven by Special Rig

(*Continued from page 40*)

After calculating the triangles by triangulation, sometimes three transits were used in conjunction. The men on the barge used anchor lines to maneuver and hold the scow in position.

From the driving data obtained while driving the test bents on approximate 1,000-foot centers, engineers calculated the length of piles in the other bents to give 46 tons of bearing apiece. Aside from the unusually long boom on the barge-mounted rig, and the accurate surveys, this preliminary work was routine.

Build Special Pile Driver

When Austin Bridge Co. placed the low bid, its engineers considered all possible methods of driving the bents. One method would have been to dredge a costly work channel across on the causeway site . . . a channel which might have filled up if a hurricane came that way.

John B. Templeton, Executive Vice President of Austin Bridge Co., put an inventive mind to work and came up with a special pile driver. It was a machine that would roll over the top of completed bents. It would set steady while handling the piles.

Work on the machine was under way for several months in the Dallas yard. There finally emerged a large rig 162 feet long, with most of its weight aft. Its work deck was mounted on 27-inch 145-pound steel WF-beam gunwales. They would support its 100-ton weight across 50-foot spans, and cantilever 50 feet to reach the bent being driven. The machine once reached 53 feet without threatening to tip.

It had a 110-foot boom and a 97-foot set of heavy steel leads hung from the apex. The rig was equipped with a Vulcan 50-C differential-acting pile hammer, a 2-drum steam hoist, and two 50-hp steam boilers.

There was a small gin-pole type of derrick aft, to hoist the pile caps as the driver moved ahead. A railroad along the port side of the deck, with a small car, carried these caps ahead to where a load line could pick them up. Each cap was made from a steel H-beam, and was a device with screw collars which went around the pile. Rollers on its top permitted the rig to move ahead. Moving lines were attached to the caps on which the machine was resting.

The new pile driver, when it had been assembled at Corpus Christi and spotted for work, looked good. It was steady as a rock, had stability, and the proper equipment.

Driving Methods

The 18-inch Monotube sections came by rail from Canton, Ohio, to the company material yard at Corpus Christi. Here they were unloaded by a truck and A-frame. The nose sections were 40 feet long, with a taper from 8 to 18 inches. Intermediate sections were 20 feet long, and a special Cor-Ten metal top piece was 30 feet in length.

The sections were then field-welded to make a good joint. The piles had to be prepared so the Cor-Ten metal would reach down to minus 4 or lower, and this created a tricky problem. If the contractor got the piles too long the joint wouldn't go down far enough. If he got them too short, the addition of extra Cor-Ten sections was too costly. Fortunately the test-bent data were accurate enough so there was a minimum of trouble.

Fleetweld No. 5 rod was used on the mild-steel weld, while Shield Arc 85 fused the Cor-Ten joint.

Loads of piles upwards of 100 feet long were then barged out to the driver, which picked up a pile at a time as it was required. Each pile was guided under the hammer by a leadsman. They were then driven through various strata of mud, sand, clay, oyster shell, and other such typical Gulf Coast formations. Bearing value was calculated at the hammer by the ENR formula, with slight modifications, after test loadings showed about 187 tons without appreciable settlement.

The new pile driver averaged three complete bents a 9-hour shift, and drove 21 piles on its record day. As each bent was completed the cap was installed and made fast, and the driver rolled ahead to the next one.

Trouble Ahead

Trouble soon developed, but it didn't last long. Specifications required the pile shells to be clean and dry when

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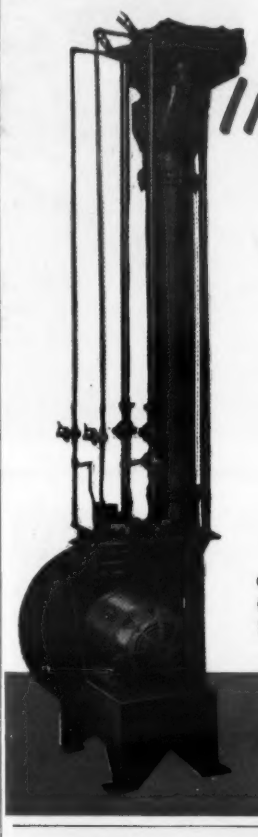

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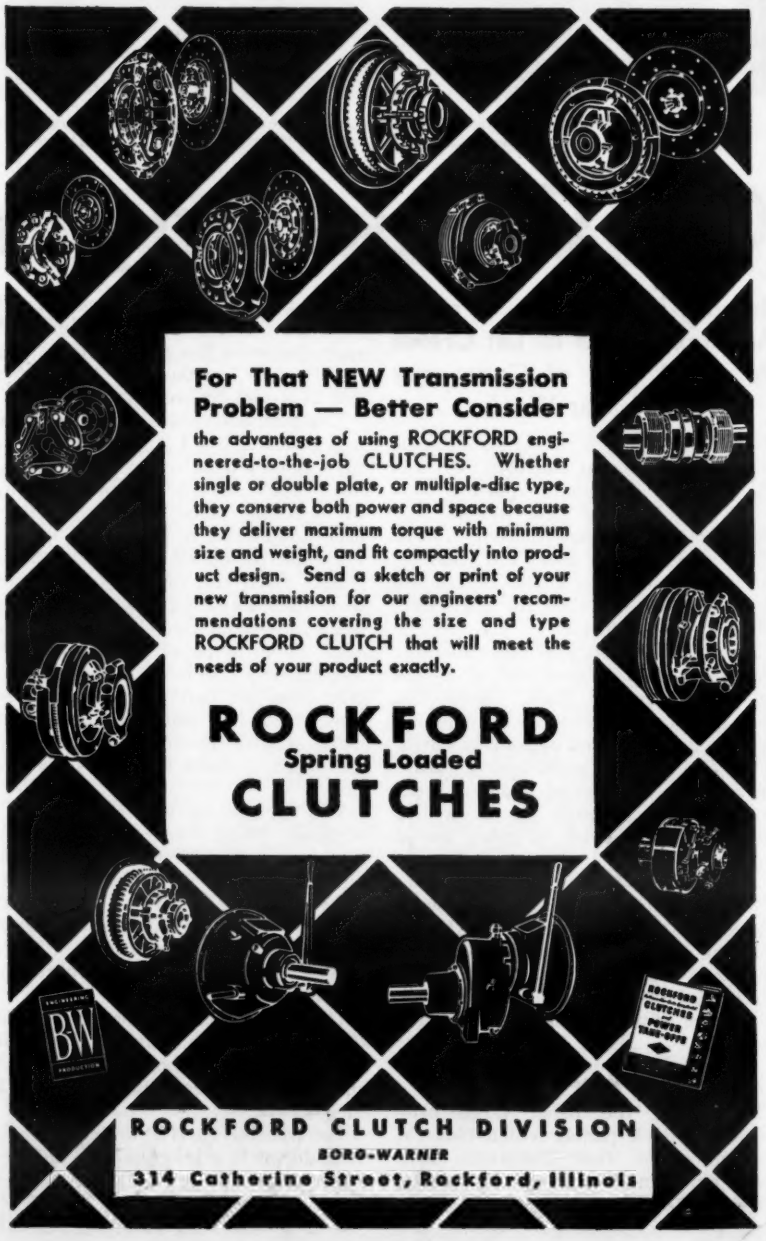

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they were filled with concrete. Approximately 20 per cent of the causeway had been driven when someone discovered that some of the pile shells were leaking. They were full of muddy sea water.

An attempt was made to clean the piles with an air-water jet. That wasn't successful, because many of the pile tips were down at elevation minus 90. A Jaeger 4-inch centrifugal pump was purchased and used with a 4-inch water jet pipe. That worked. The shells were cleaned and dried up just before they received concrete.

Welding technique at the material yard then tightened up. Every weld was carefully inspected to make the future shells watertight, and some patching was done. That corrected most of the trouble. A great percentage of the shells stayed dry and clean from the time they were driven until they were poured.

Piles Filled With Concrete

After each bent was checked for alignment, the pile shells were filled with concrete. Alignment tolerances were 2 inches along the structure center line and 4 inches at right angles. The upper 30 feet of each pile was reinforced with steel.

Concrete was hauled by a truck-mixer fleet owned by South Texas Materials Co. Batched from a portable plant, the material was dumped to barges containing four 1½-yard Heltzel transfer buckets. There was a 30-minute time limit between the batch plant and the pouring point, so schedules had to be tight. Each loaded barge was towed out to the 655-B P&H placing crane, which hoisted the buckets up to the pour. The concrete was dropped to the bottom of the piles.

Pile concrete was placed ahead of the beams, so the pour was not monolithic.

Designed under supervision of the Texas Highway Department, the project was done under general supervision of D. C. Greer, State Highway Engineer; Randle B. Alexander, Bridge Engineer; Tom C. Davis, District Engineer; and F. B. Mason, Senior Resident Engineer. Jack Turquette supervised field operations for Austin Bridge Co.

Nut-Running Tools

Two new air-operated Impactools for nut-running have been announced by Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y. Model 504 is for nut-running up to ⅜-inch bolt size; 510 is for nut-running up to ¾-inch bolt size.

Both tools are of the pistol-grip type and are streamlined and balanced for ease of operation. Large easy-to-grip reverse caps are deeply grooved so the tools may quickly be reversed, even with greasy hands. Emphasis has been placed on scientific muffling to lower operator fatigue and increase safety, the company says.

Futher information may be secured from the company. Or use the Request Card at page 16. Circle No. 23.

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New overhead fluorescent lighting designed by Sylvania Electric Products, Inc., Towanda, Pa., furnishes approximately 100 foot-candles of light at desk level in the 3,100-square foot drafting department of the New England Electric Power Co. For further information, use the Request Card at page 17. Circle No. 102.

Preparing Abrasives

Copies of Brief IB-1, "Calcium Chloride for Ice Control", are available from the Calcium Chloride Association, 909 Ring Bldg., Washington 6, D. C. They contain information from authoritative ARBA and HRB reports on types of abrasives and recommended procedures for treating, storing, and handling.

This literature may be obtained from the Calcium Chloride Association, or by using the Request Card at page 16. Circle No. 71.

New Pump Co. Officers

Kenneth G. Lundie was elected Vice President in Charge of Sales and Perry Brown was elected Vice President in Charge of Engineering at the last meeting of the Board of Directors of the Johnston Pump Co., Los Angeles, Calif. Before being promoted, Mr. Brown was Chief Engineer and Mr. Lundie was Sales Manager.

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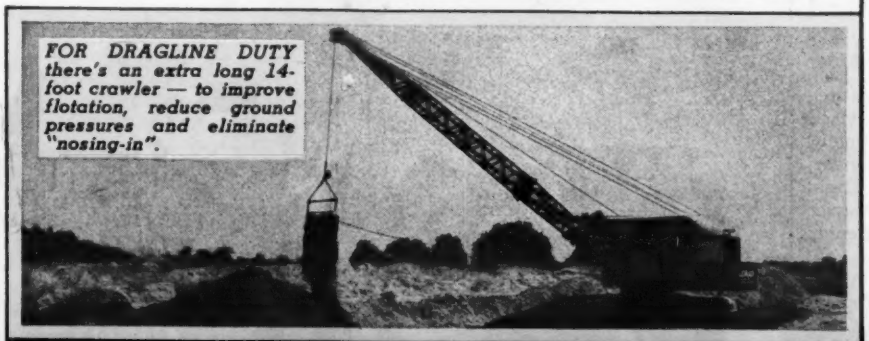

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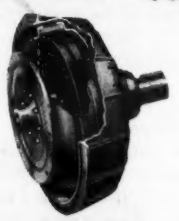

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Steel Work Is Tough For Texas Causeway

(*Continued from page 40*)

Co., because the right steel had to come off the top of each load to lighten the barge as it went past the causeway. Each bargeload contained about 1,000,000 pounds.

The barges came down the Ohio and Mississippi Rivers, and tugs picked them up at New Orleans. The rest of the trip was made along the Intracoastal Canal to Corpus Christi, where two small tugs owned by the contractor took over.

A 75-foot work channel 6 feet deep had previously been dredged alongside the causeway. The load on two barges listed slightly so the corner drew about 7½ feet of water. These two had to be dragged through the mud by three tugs, but there was no difficulty with the others.

Each load was tied to a barge-mounted structural crane, which handled the steel. The field crane was a standard P&H 655-B crawler machine, lashed down to the deck of a 90 x 30 steel barge.

The 3½-ton girders were unloaded from the shipment barges and stored temporarily across the caps, very nearly in their final position. Smaller material, such as diaphragms and other bracing, was placed on a small work barge where it would be available for erection. The girders were picked up by cable slings on a steel strongback, and set down on the flanges. Several times the wind blew hard enough to blow the heavy pieces over. The heaviest piece was a 4½-ton set of beams for the narrow bascule span in the causeway, but it caused no particular trouble.

The crane dropped back to the west side after it had unloaded a barge, and began to erect the steel which it had stored. It was not too difficult a job. The piles and caps had been put in place by accurate surveys, and the leveling plates had been installed with care. Each girder was set down on a rocker plate and bolted temporarily until field welding could be started. The same was true of the bracing diaphragms between the beams.

American Bridge Co. prepared the ends of each beam for welding. The ends fitted perfectly, and field welding was simplified to a large extent by the fine millwork which had been done at the fabricating plant.

Welding

Welding crews in the field used a small air buffer to clean the joints prior to running the first bead. Eight Lincoln arc machines were used, and welders had to be certified. Each weld was made in three passes. A Fleetweld No. 5 stringer bead was laid and cleaned. Then two filler beads of the same rod followed, each pass being cleaned thoroughly. The fresh welds were then painted with red lead to prevent rust.

Especially favorable weather was necessary. Windy weather, heavy dew, or rain all interfered seriously with welding. The welders worked from timber platforms, with canvas shelters to protect the operation, but even so it took good conditions to get the welding done.

Personnel

The Nueces Bay Causeway was designed and its construction is supervised by the Texas Highway Department. D. C. Greer is State Highway Engineer, Randle B. Alexander is Bridge Engineer, and Tom C. Davis is District Engineer. F. B. Mason is the Senior Resident Engineer.

Jack Turquette, General Superintendent, was in charge for Austin Bridge Co. It was his job to figure out the intricate steel-loading schedule which worked so that the barges would get lighter and draw less water as they got farther over into shallower water.

The new causeway will carry traffic between Corpus Christi and the cities of San Antonio, Houston, and Galveston. Later on, say the engineers, a second causeway exactly like the present one may be built if future traffic justifies it.

Five Diesel Engines For Varied Operations

Five new diesel engines designed for automotive service on and off the highway, road and construction machinery, electric generator plants, tractors, pumps, compressors, and other services, have been announced by the Diesel Engine Division of Harnischfeger Corp., Port Washington, Wis.

The company points to two important features of these models. The cylinder-head and liner assembly is interchangeable between the 1, 2, 3, 4, and 6-cylinder units, thus making it possible to interchange each cylinder by taking off four bolts and disconnecting the connecting-rod bearing. The change may be performed in a matter of minutes, according to the manufacturer. The second important feature claimed by the company is the light weight of the units to give greater portability.

This is the new Harnischfeger Model 687-C 6-cylinder diesel engine. It has a 4.5 x 5.5 bore and stroke, a 522-cubic-inch displacement, and an intermittent bhp of 145 at 1,400 rpm. Cylinders are interchangeable with Harnischfeger's four smaller models.

All cylinders are designed with a 4.5 x 5.5 bore and stroke and a total displacement ranging from 87 cubic inches for the 1-cylinder model to 522 cubic inches for the 6-cylinder model. These units offer an intermittent brake-horsepower range from 27 to 145 when operating at 1,400 rpm. All units have forced-feed lubrication and a compression ratio of 16 to 1. Each cylinder on the new models has an independent power-assembly unit which provides a saving in time on maintenance work and reduces the cost of major overhaul, Harnischfeger says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 63.

New Man at Walker-Turner

Lawrence H. Russell, formerly Sales Manager of the Power King Division of the Atlas Press Co., has joined the Walker-Turner Division of the Kearney & Trecker Corp., Plainfield, N. J., as Division Sales Manager.

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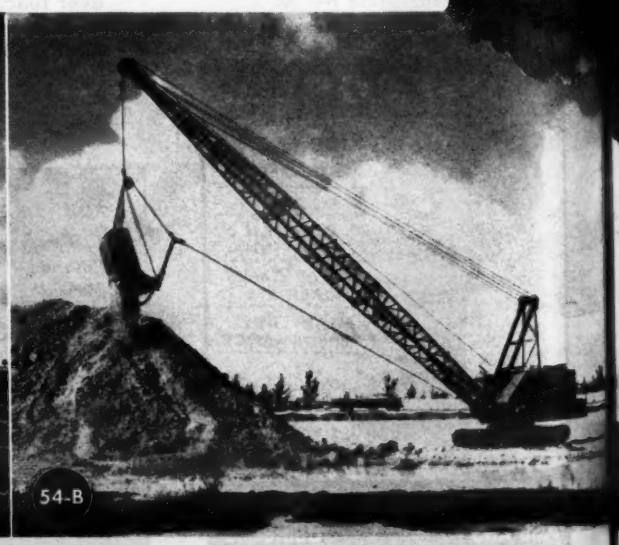


Speedy Deck Pour On Texas Causeway

(*Continued from page 41*)

its center. It has a manually rotating, movable work platform on railroad rails at either end. After picking up a load of form panels, men can move the platform ahead to reset them.

A timber deck covers the two 16 x 6-inch I-beam gunwales which came in five sections for easy field assembly. The carrier moved on rollers at each pile bent, suspended from the concrete beams. One-inch hanger rods from the beams passed through a 6 x 8-inch tie timber around the center two rows of piles. A 6 x 16-inch timber, laid with its narrow side up across this frame, carried the rollers. In turn they supported the gunwales of carrier.

A somewhat similar system supported the beam forms. Hanger rods from the pile tops came down to secure against the cross timbers which supported the beams.

C. & E. M. Photo

This barge-mounted reinforcing-steel jumbo made the delivery and placement of causeway reinforcing steel an easy job.

Concrete Pumped

Concrete was placed by a Rex 160 Pumpcrete machine and a 7-inch delivery pipe. The material was batched and mixed by South Texas Materials Co., which delivered to the causeway in Rex Moto-Mixers. Concrete was then fed to the hopper of the Pumpcrete machine and sent to the point of placement.

Placing began on the west end. Turquette expected to move his equipment forward 225 feet twice a week to meet the 450-foot schedule. Fresh concrete from the delivery pipe was dropped direct to the deck, or chuted around where it was needed. A crew of about 12 men also helped to shovel the material into curbs, and spread it around. Engine-driven vibrators worked the material around the steel.

The delivery pipe led along the deck at a quarter point. The first pass was made with an elbow, which routed the concrete across the pour. When that course was done the elbow was disconnected and the straight pipe then discharged to the unpoured side. Men cleaned and swabbed each pipe section as it was disconnected.

The reinforcing steel was supported permanently by concrete blocks between the forms and the lower mat, but additional temporary support was necessary because men walked around over the steel while the pour was in progress. Temporary support in the form of 2 x 4 blocks was provided. The wooden chairs could be removed as the concrete pour spread.

Men tried to get the material as level as possible with shovels. Then a rigid screed, which reached across the span between steel form headers, came into play. It had handles at each end, and a true timber strike-off which was replaceable. The screed was passed from one side to another, and that was followed up by troweling with long-handled straightedges. A finishing bridge also let local areas be touched up. The final finish was pulled with a canvas belt, lengthwise with the bridge center line.

Deck-Level Steel Platform

A barge-mounted platform for the storage and delivery of reinforcing steel saved time and kept that operation ahead. The platform was supported by timber uprights. Men could walk over to this platform at causeway-deck level, wherever they were working. It simplified the operation and gave much more working space on the causeway deck.

In fact, the unhesitating use of job innovations and special equipment not only speeded the work, but made it much safer for all the workmen.

Under-Car Unloader

A new combination chain-and-belt car unloader has been introduced by George Haiss Mfg. Co., Inc., Division of Pettibone Mulliken Corp., 381 Canal Place, New York 51, N. Y. It is designed for unloading sand, gravel, crushed stone, and other materials from hopper-bottom cars. The capacity of the new machine is 5 tons per minute.

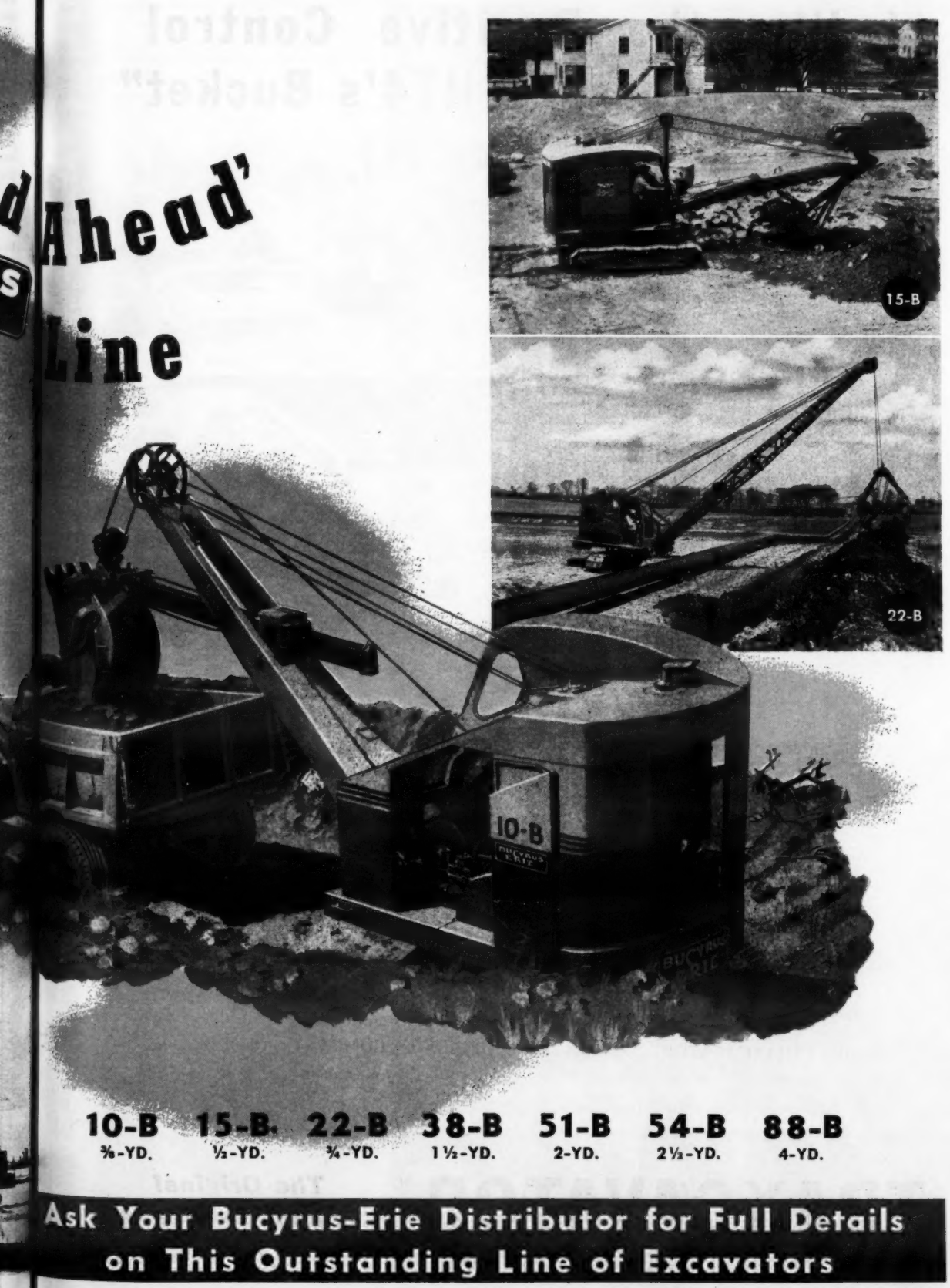
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 51.

New Stapling Hammer

A new heavy-duty automatic stapling hammer, for tacking on form linings, diamond-mesh metal lath, roofing and siding, etc. has been announced by Bostitch, 827 Mechanic St., Westerly, R. I. Model H4 features scientific balance to deliver a powerful blow with a natural swing. It drives staples with a ½-inch crown and ¾-inch legs, and these staples are so engineered that the legs diverge inside the work, putting them under tension and increasing their holding power. They can't vibrate out, Bostitch says.

This one-hand machine leaves the other hand free to hold material in place. It operates at arm's length, so that the operator is able to cover a large area.

Literature on this stapling hammer may be obtained from the company, or by using the Request Card at page 16. Circle No. 107.



The Wausau trailer-type spreader attaches to any dump truck. It spreads from 8 to 20 feet wide depending on truck speed and fender setting.

Trailing Spreader Designed for Safety

A new trailer-type spreader designed for operator safety and for positive control of thickness, width, and direction of spread is built by Wausau Iron Works, Wausau, Wis. It is a self-contained unit that can be attached in a few minutes to any dump truck, according to the manufacturer. It spreads sand, cinders, chips, lime, calcium or other materials from 8 to 20 feet wide, depending upon truck speed and fender setting. A sturdy axle and differential provide power for both hopper agitator and spinner.

Thickness of coating is regulated by a lever which opens and closes the hopper jaws. Width of spread and control of the left side for oncoming traffic are accomplished by raising or lowering a directional fin or fender, which is regulated by a lever within easy reach of the operator. The operator stands on a platform, a nonskid self-cleaning grating, and is protected from the side and back by a curved basket-like steel guard. Hopper capacity of the new Wausau spreader is about 2 cubic feet. The size of the hopper is 36 x 33 inches on top, 10 inches square on bottom, and 9 inches deep. Total weight including truck hitch is 410 pounds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 35.

Wickwire Personnel

John H. Burch is now Sales Manager of the Detroit District of the Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corp. He succeeds L. A. Watts, who is now Sales Manager of the Wire and Pig Iron and Semi-Finished Steel Departments of the Division.

Gooseneck-Boom Hoe On 3/4-Yard Excavator

A new gooseneck-boom hoe attachment has been designed for the P&H Model 255A excavator manufactured by the Harnischfeger Corp., 4400 W. National Ave., Milwaukee 14, Wis. This attachment incorporates new features in trench-hoe design which, the company claims, increase speed and digging depths, and improve overall performance.

Operation of the new trench hoe, Harnischfeger says, is 50 per cent faster due to only a two-part hoist line. A power-operated auxiliary gantry raises and lowers the boom. The low-gear transmission on this ¾-yard excavator is designed to make greater power available for tough digging. The machine can cut a vertical end at the start of the trench and can trim vertical walls; the special hoe-stick linkage produces a chopping action.

Increased speed and digging depth are features of the new gooseneck-boom hoe attachment for the P&H Model 255A excavator.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 10.

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. . . "It makes for quicker loading"

Three times per minute, this HT4 Hydraulic TRAXCAVATOR crowds its stoutly-reinforced 1¼ cubic yard bucket heaping full of scrambled rock and rubble.

. . . "and smoother dumping" . . .

Three times per minute, the HT4 swiftly lifts its heaped bucket; gives it the tilt that avoids spillage; pivots, and *eases* the heavy material into the truck to minimize body shock and abrasion.

Three "passes" load a truck, and the HT4 keeps three trucks busy; finds time to position the blasting mats and do some grading on this Nashville store basement excavating job.

"I've seen 'em all — nothing else can compare," states Job Supt., W. E. Mitchell, for Oman Construction Co., Nashville, Tennessee." I like the positive control on the Hydraulic HT4 TRAXCAVATOR'S bucket. It makes for quicker loading and smoother dumping."

The HT4 TRAXCAVATOR is operated by the "Caterpillar" constant-power hydraulic system with a 4-position valve. Lifting arm cylinders are double-acting — so are bucket control cylinders. Hydraulic "help" is there, to dig tough stuff. And the HT4 can lift its load to the desired height — can carry and dump from any lift point under positive control.

See your TRACKSON-"Caterpillar" dealer for full information on the HT4, or any of the other 4 TRAXCAVATOR Models (½ to 4 cubic yard capacity) that fits your needs and conditions. Or write direct to TRACKSON COMPANY, Dept. CE-110, Milwaukee 1, Wisconsin.

TRAXCAVATOR® *The Original Tractor Excavator*

The Tarwater lightweight electric tamper, using a clay spade, speeds ditching for a sewer line.

Lightweight Tamper Also Spades and Cuts

A new high-frequency electric tamper, designed for ditching, foundations, asphalt breaking, backfilling, and demolition work, has been developed by the Tarwater Railway Supply Co., Investment Bldg., Redlands, Calif. The tool weighs 48 pounds and delivers up to 1,800 punches per minute, the company says.

The Tarwater tamper may be plugged into any portable high-cycle generator or converter used for powering other tool equipment. It may be used with tie tampers, clay spades, clay picks, moil points, chisel bits, cribbing forks, digging chisels, frost wedges, drills, and dirt tampers. Two cap screws on the 2-position tool holder permit quick and easy mounting and removal of tools. The tools have a shank size of ⅞ inch hexagonal x 2¾ inches or ⅞ inch hexagonal x 3¼ inches.

A toggle switch starts the electric tamper. The self-lubricating design permits safe operation up to 400 hours without attention, according to the manufacturer. To cover a large working area, two to four tampers may be operated from a single high-frequency portable generator.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 3.

New Impact Driver Aid to Maintenance

With a twist in the desired direction and a few raps with a hammer, screws, bolts, or nuts can be tightened or loosened with a new hand tool developed by H. K. Porter, Inc., Somerville 43, Mass. The Impakdriver is constructed on a cam principle that translates the impact from a hammer's blow into torque.

Useful for starting stubborn nuts, bolts, or screws that are rusted or frozen on, the Impakdriver also enables working in hard-to-get-at places. It is sold by itself or in sets with different combinations of bits and sockets for various sizes and types of screws, bolts, and nuts.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 94.

The Impakdriver saves tempers when it comes to tightening or loosening ornery screws, bolts, and nuts.

Highway-Planning Reports

The Bureau of Public Roads has just published a 48-page "Bibliography of Highway Planning Reports" which lists such reports issued from 1930 to April, 1950. It covers traffic, origin-destination, location, and highway-needs studies ranging from long-term state-wide studies to location surveys for specific routes and city traffic counts.

The bibliography costs 30 cents a copy and can be secured from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Repair and Adjustment Of Surveying Instruments

A 4-page folder describing instrument repair and adjustment service offered by J. H. Weil & Co., 1315 Cherry St., Philadelphia 7, Pa., points out that this work is undertaken by factory-trained craftsmen. The company is prepared to adjust or repair all makes of surveying equipment. Estimates covering all necessary repairs are mailed the same day the instrument is received for examination. The company also points out that inexpensive periodical checks insure against costly and untimely repair bills.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 36.

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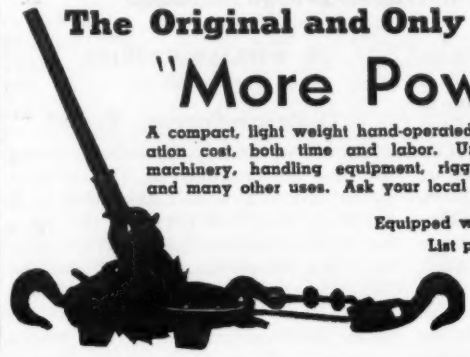

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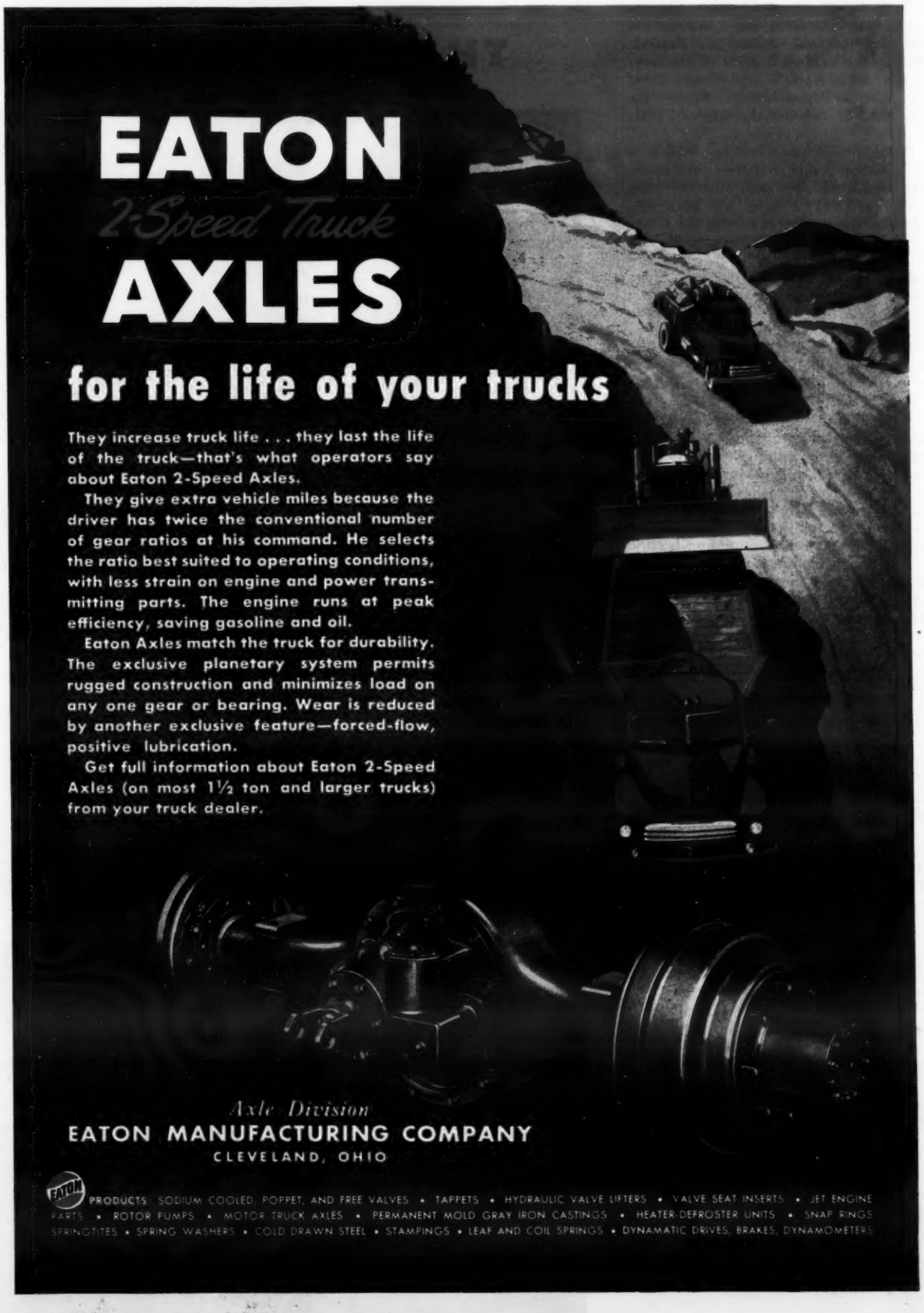

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Trench-Type Tunnel Is Started at Norfolk

Dredge Makes Cut in Bed of River for 2,100 Feet of Casing To Carry Vehicular Traffic; Bridge Included

By WILLIAM H. QUIRK,
Eastern Editor

C. & E. M. Photo
The bucket-type dredge Atlantic clears a trench for the Elizabeth River Tunnel at Norfolk, Va. This is her port side.

✦ NORFOLK, Virginia, one of the great natural harbors on the east coast, owes its growth to deep water lying close to land indented by rivers that afford extensive berthing facilities. While these features are highly advantageous for water commerce, they present grave problems to the smooth flow of vehicular traffic in the densely built-up centers of population that surround such ports.

At this major shipping point, the Elizabeth River outlets into Hampton Roads. Above its estuary the river forks into southern and eastern branches that follow fairly closely their compass directions. Between the branches lies Berkley, an old section of Norfolk. Across the eastern branch of the river is the rest of Norfolk, including most of its area and population. Across the southern branch lies the city of Portsmouth.

Thus these three shipping areas, with their valuable and sheltered dock space, are separated from each other by busy water arteries. Ferries ply back and forth across the lower part of the Elizabeth River connecting Portsmouth and Norfolk. Berkley and Norfolk are joined by an old and narrow bridge spanning the eastern branch. The first bridge over the southern branch is more than 2 miles upstream from the tip of Berkley, and well above the sprawling Portsmouth U. S. Navy Yard.

Tunnel-Bridge Link

Even before the last war, when the entire Norfolk-Portsmouth sector was swarming with military activity, the need for direct and modern land links across the river branches became painfully obvious. In 1942 the Virginia General Assembly created the Elizabeth River Tunnel Commission for the purpose of planning and constructing an expressway tying together Portsmouth, Berkley, and Norfolk. The route developed is 1.8 miles long, extending from a plaza in Portsmouth, across the tip of Berkley, to a plaza in downtown Norfolk at City Hall Avenue.

The Commission decided on a tunnel crossing for the southern branch because of the great use of this portion of the river by ocean-going vessels, and the location of the Navy Yard upstream of the crossing. A high bridge would have been necessary, but the military frowned on any bridge located seaward of such a major installation as a navy yard. On the Berkley peninsula the tunnel emerges from the ground. The eastern branch of the river is crossed by a bridge, making the construction more economical than an all-tunnel route. Land takings in downtown Norfolk for a bridge approach and plaza would be simpler and less costly than for a tunnel entrance.

Cost of the entire project is estimated at $23,000,000, which sum has been raised by the Commission through the sale of 3½ per cent revenue bonds. Tolls will be charged for the tunnel crossing, but the bridge over the eastern branch will be free. An administration building and toll booths will be erected at the Berkley plaza. The existing bridge connecting Main St. Norfolk with Main St. Berkley will be torn down when the new route is opened. Construction on the highway bridge-tunnel crossing got under way in February, 1950, and is scheduled for completion in March, 1952.

Contractor-Engineer Team

The Commission awarded a contract for the construction of the bridge-tunnel link to Merritt-Chapman & Scott Corp. of New York City and the Tidewater Construction Corp. of Norfolk on their low joint-venture bid of $16,263,642. Merritt-Chapman & Scott Corp., for its share of the work, has undertaken the construction of the tunnel which measures 3,350 feet long between portals and carries two lanes of traffic, and a single ventilation building located on the Portsmouth side.

Tidewater Construction Corp. is building the remainder of the 9,600-foot-long project. This includes the four-lane bridge measuring 2,135 feet between abutments on the eastern branch; the navigation channel is spanned by a double-leaf bascule, 179

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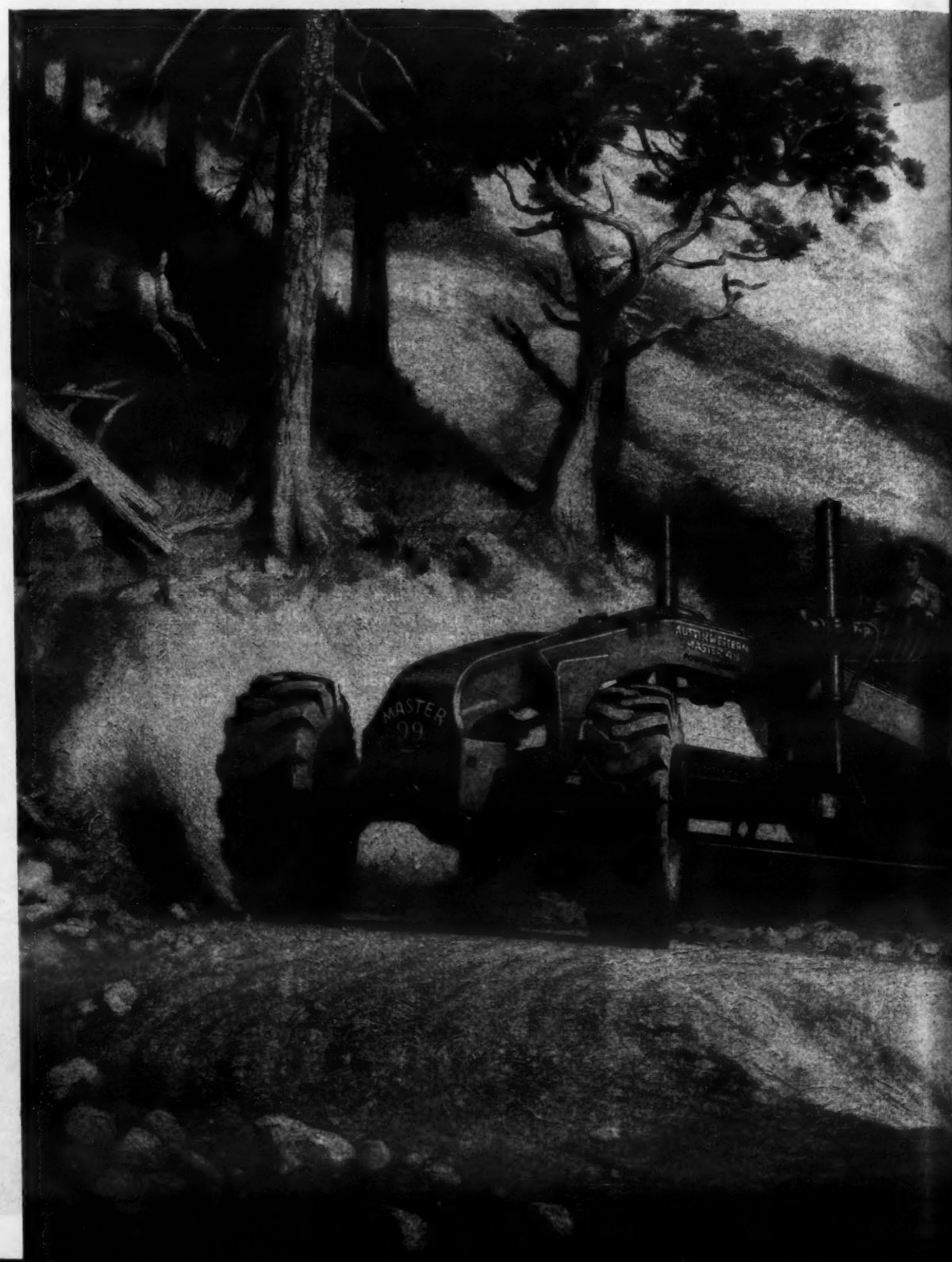
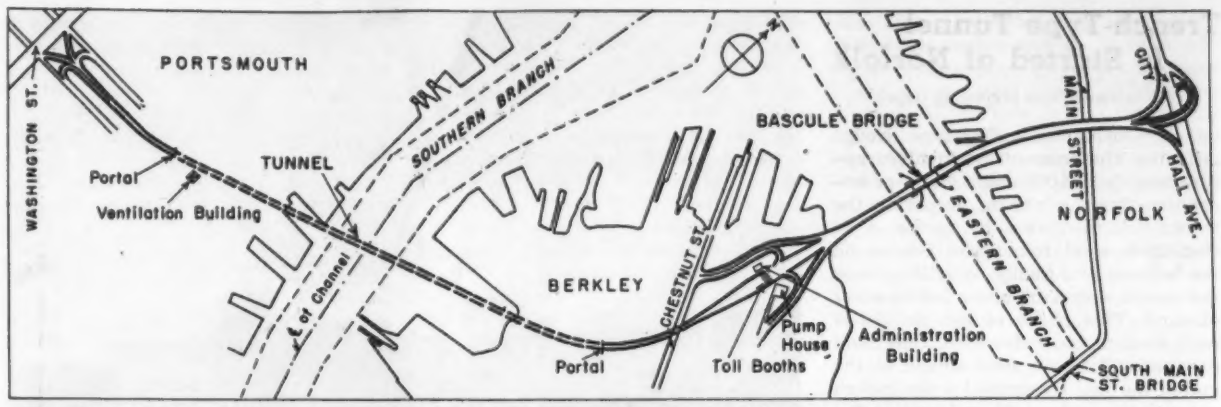
THE POWER GRADER



feet long. The Norfolk contracting firm is also handling the approach work to the structures, and the three plazas at Portsmouth, Berkley, and Norfolk.

Engineering, including the design and supervision of construction, is being done under a joint venture by the consulting engineering firms of Parsons, Brinckerhoff, Hall & Macdonald of New York City, and the J. E. Greiner Co. of Baltimore, Md. The latter is directing the work from the Norfolk plaza to Chestnut Street in Berkley, which includes the bridge and approaches. PBH&M is handling the rest of the project, which takes in the tunnel, ventilation building, and Portsmouth plaza. Both contractors are moving ahead with their respective portions of the work.



The Elizabeth River crossing will extend from a plaza in Portsmouth, Va., under the southern branch of the river, across the tip of Berkley, and by bridge over the river's eastern branch to City Hall Avenue in Norfolk.

Trench-Type Tunnel

The trench type of tunnel construction was chosen over the shield-driven method for the sake of economy, preliminary estimates indicating that the design selected could be built at about half the cost of a similar tunnel driven with a shield. At present there are nine trench-type tunnels in the United States and one in Europe under the Maas River at Rotterdam, Netherlands. This will be the fourth of its type built by Merritt-Chapman & Scott; the others being the State Street double subway tube under the Chicago River, Chicago; the Detroit-Windsor, Canada, vehicular tunnel; and the Washburn vehicular tunnel under the Houston Ship Channel at Pasadena, Texas. The latter was completed early this year. The consultant firm of Parsons, etc., was the designing and supervising engineer on the Detroit-Windsor; Baytown, Texas; Antwerp, Belgium; and Riachuelo, Argentina, tunnels.

In short, the construction of a trench-type tunnel involves the prefabrication ashore of the tunnel casing which, after towing to site and sinking, is then locked into place in a deep trench previously dredged across the river bottom. Of the 3,350-foot portal-to-portal tunnel length, the subaqueous portion under the ship channel is 2,100 feet long, made up of seven sections of double-shelled steel casing, each 300 feet in length. On either side of the underwater section, the remainder of the tunnel will have the conventional box-type cross section built by cut-and-cover methods. From the portals, retaining walls will flank the roadway over the rest of the distance to the plazas.

Fabrication Under Subcontract

The seven sections of casing are being fabricated for Merritt-Chapman & Scott Corp. by Bethlehem-Sparrows Point Shipyard, Inc., of Sparrows Point, Md., under a subcontract. They measure 35 feet across the width of the outer octagonal-shaped shell, and 31 feet 4 inches across the width of the inner ring. The shell plates are 5/16 inch thick; diaphragms supporting the outer casing are on 12-foot centers along the tube.

The 300-foot sections are being built on shipways at Sparrows Point on the opposite side of the Patapsco River from Baltimore, at the upper end of Chesapeake Bay. As they are fabricated, concrete is placed in the keel of each section, this added weight also serving as ballast. When the sections are finished, they will be towed down Chesapeake Bay to "shape-up" stations near the tunnel site where M-C&S will do preliminary interior work before the sections are sunk into position in the prepared trench.

According to the progress schedule, the first tube will be delivered to the site some time this month, and the remaining six will be launched from the shipways at the rate of one a month. About a month will be required for fitting out each tube at the shape-up station before it can be laid in the trench. This includes the inner concrete lining, which has a minimum thickness of 1 foot 6 inches, roadway, walkway, ducts, vents, etc. The final 28-foot 4-inch inside diameter of the tube accommodates a 22-foot roadway measured face to face of curb. Below the 1-foot 8-inch floor slab, including pavement, are the exhaust air duct and ports. Above the 14-foot 2-inch vertical clearance is a hung tile ceiling that encloses the exhaust air duct and ports.

The first section of tube will probably be laid in the trench early in 1951. The steepest grade in the tunnel will be 5 per cent, on the Portsmouth end.

Preparing the Trench

Trench work for the tunnel is being done under a subcontract by the Atlantic Contracting Corp. of Norfolk

(*Continued on next page*)

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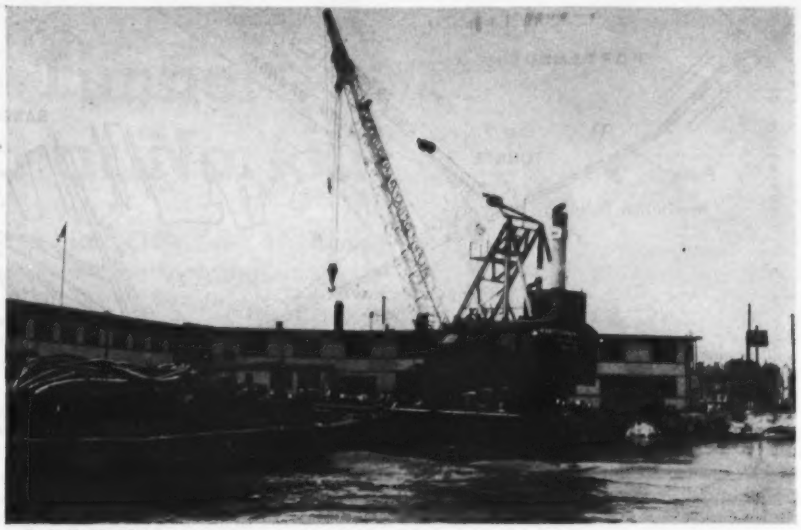
Trench-Type Tunnel Is Started at Norfolk

(*Continued from preceding page*)

which is using its bucket-type dredge Atlantic. The subcontract involves approximately 925,000 cubic yards of excavation for the trench; preparing the trench for the tubes by laying a 2-foot-thick sand foundation course on the bottom; and finally backfilling over the tunnel with a minimum 5-foot cover of sand. This phase of the project is estimated to cost about $825,000, and dredges will be engaged almost to the end of the job. Dredging for the trench got under way June 20, and is expected to take 12 months to complete.

The main channel of the river is about 450 feet wide with a present depth of 45 feet and a proposed future depth of 50 feet. This latter depth must be maintained between pierhead lines after the tunnel is laid, so it is evident that a cut almost 50 feet deep must be made in the riverbed to contain the tubes. Depth of water decreases from the pierhead lines up to the shore. At the deepest part of the tunnel the excavation goes down to minus 97.5 mean low water.



C. & E. M. Photo

The R-25 American Revolver crane with 110-foot boom, mounted on the floating rig Choctaw, pulls sheet piling from the Coast Guard pier on the Portsmouth side to clear a right-of-way for the tunnel. The same rig will place tunnel tubes in the dredged trench. Those barracks in the background will also be demolished.

A permanent easement 50 feet wide has been acquired along the river bottom. The bottom width of trench will be 40 to 50 feet wide, enough to accommodate the octagonal-shaped tube. Side slopes are expected to average 2½ to 1, with a steeper grade where marl is encountered in the riverbed. The material to be dredged consists of silt, coarse and fine sand, shells, and clay. In the channel the top 4 to 5 feet is soft mud digging. Beyond the limits of the channel the river mud has a depth of about 25 feet before the harder material is encountered.

Dredge Atlantic

The dredge Atlantic has a wooden hull 120 feet long x 42 feet wide x 14 feet deep. Above the black-painted hull is the black and white deck superstructure containing quarters for a crew of 30. At the bow is a 35-foot A-frame tied back to the hull with four cable lines. The A-frame supports a 50-foot boom over which runs 375 feet of 1¾-inch cable holding the digging bucket. Of this length 100 feet covers the distance from winding drum to the bucket in a raised position. The remaining 275 feet is available for dropping the bucket to the depth required. In the soft digging a 7½-yard clamshell bucket was used; in the harder strata this was exchanged for a Williams 6-yard clamshell bucket weighing 17 tons.

Five lines to anchors off the dredge hold the craft in position for digging, or for moving along over the trench it is excavating. A 1¼-inch line runs out to a stern anchor; a ⅞-inch line is tied to breast anchors on either side of the dredge; a ⅞-inch quarter line is secured to anchors off the bow at the quarter points. These lines are 1,000 feet long; Leschen wire rope is used throughout.

A Scotch Marine 300-hp steam boiler powers the dredge. Oil-burning firing equipment includes three Todd burners and two Wing turbine blowers. Average daily consumption of bunker C oil is 50 barrels for 24-hour operation. The Atlantic's 450-barrel storage tank is replenished with Standard Oil fuel towed out in a 1,500-barrel barge.

(*Continued on next page*)

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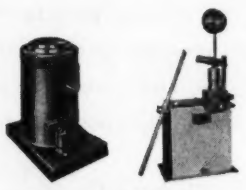
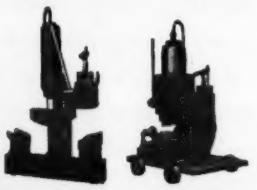


Jacks Pumps



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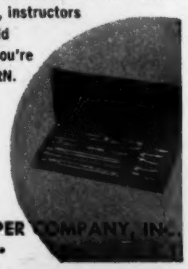

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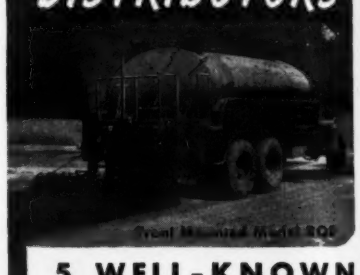

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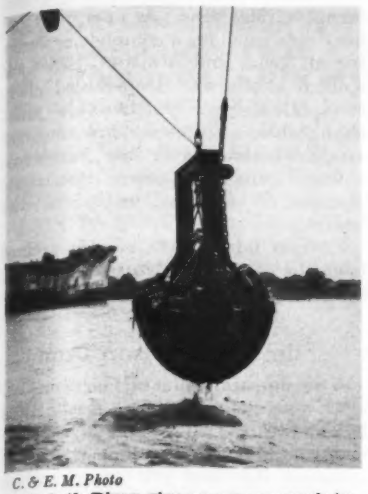

C. & E. M. Photo
Elizabeth River gives up some muck to the 7½-cubic-yard manganese clamshell digging bucket of the dredge Atlantic.

A Hardie-Tynes main engine drives the 2-drum hoist on the digging bucket. Another steam engine powers the single shaft for the drums that wind the various anchor lines. Two G-E generators furnish power and light—a 25-kw unit for the lighting, and a 20-kw unit for welding outfits, power tools, etc. Communication with the shore is maintained with an RCA radiotelephone.

Digs Own Flotation

The Atlantic began dredging operations on the inshore side of the channel, working toward Berkley. As it reached shallow water, the dredge dug its own flotation. At the beginning of the work, the dredged material was loaded into a single steel-hull bottom-dump scow of 1,000-yard capacity and measuring 150 x 40 x 14 feet. Average loading time was 2½ hours. When the scow, moored alongside the dredge, began hitting bottom, the dredge also had to dig flotation for the scow. This meant re-handling the material, for the scow could not be brought up alongside for loading. Material was dropped into the water on one side of the dredge, and picked up later.

As the work progressed, three scows were used in loading and two tugs for towing. Thus one scow was always at the dredge. Material was towed out into Hampton Roads off Old Point where a deep hole was buoyed off by Army Engineers for use as a dumping area. The one-way haul was about 12 miles. Two tugs powered by Fairbanks-Morse diesel engines did the towing—the Oscar F. Smith, 110 feet long with a 750-hp engine; and the Virginia, 105 feet long with a 450-hp engine. Other floating equipment included the Joe, a 30-foot crew boat driven by a Buda 110-hp diesel engine.

Dredging is carried on 24 hours a day, 6 days a week, with Sunday set aside for maintenance and repairs. Operations of the Atlantic Contracting Corp. are under the direction of George Seymore, Superintendent. John Riggs is Captain of the Atlantic, and O. O. Culpepper is its Chief Engineer.

Shore Work

Merritt-Chapman & Scott Corp. was not idle while the dredging was under way. When the Atlantic started digging off the Berkley shore, M-C&S moved its big floating derrick Choctaw over to the opposite Portsmouth side to clear a path for the dredge. The Choctaw rig consists of a 120 x 32-foot steel hull on which is mounted an R-25 American Revolver oil-burning crane equipped with a 110-foot boom. Some of its preliminary work included the pulling of sheet piling from the bulkhead at the Coast Guard pier. The pier as well as one wing of the barracks along the shore will be demolished to clear a right-of-way for the tunnel. The floating rig will be used later in placing the tubes in the dredged trench.

Details for sinking the tubes have not been entirely worked out, but the contractor is planning to bring in his large floating concrete plant now finishing up the final touches of the substructure on the Delaware River Bridge near Wilmington, Del. The space between the inner shell and the outer shell around the diaphragms will be filled with tremie concrete after each tube is floated into exact position over the trench. Bulkheaded at the ends, the tubes are sunk carefully by the weight of the concrete. Target masts, high enough to project above the water from the submerged tunnel, are welded to the top of each tube to aid in setting it precisely as to line and grade.

The large floating cranes assembled at the site will control the lowering and joining of the tube sections. This is a difficult problem to handle since the tubes when completely submerged will displace around 10,000 tons of water and be subjected to a pressure of approximately 50 tons due to current velocities. The joint between the two adjacent tube sections will consist of a projecting hood plate on the lower half of the first section sunk. The tube section to be joined has a similar projecting hood plate on the upper half. Cast steel lugs are welded to the upper and lower hood plates on both sides. By means of a 5-inch-diameter pin dropped into holes in these lugs by divers, the tube sections are quickly joined together and fixed.

The joint is rendered watertight on the outside by a tremie pour of concrete that will be contained within the dam plates constructed at the end of each tube section and the curved side plates connecting into the end dam plates, using a steel sheet interlock type of connection. These curved side plates are driven into the sand cushion on the river bottom in the same manner as an ordinary steel sheet pile. The joint will be rendered watertight on the inside by welding, concreting, and grouting. When the tubes are laid and joined, the interior bulkheads will then be unwatered and removed to permit the finishing of the tunnel lining and such items as paving, tiling, lighting, etc. The ventilation building for the tunnel is located close to the portal on the Portsmouth side.

The structural-steel tubes for the

(Concluded on next page)

MORE POWER
BUDA 6-DAS 844
280 h.p. at 2100 r.p.m.

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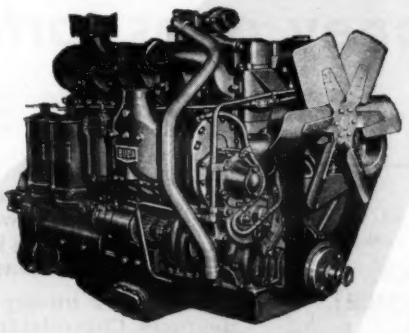

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Don't overlook the profit potential of the TS-200—the little earthmoving giant in the 9 to 12 yard class, now available with the Cummins HRB-600, 165 h.p. Diesel.

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2- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.

Hydraulic and Cable-operated Dozers.

Trench-Type Tunnel Is Started at Norfolk

(*Continued from preceding page*)

2,100 linear feet of subaqueous tunnel have a total weight of 4,200 tons, or 2 tons of structural steel for every foot of tunnel. In addition the tunnel contains 2,500 tons of reinforcing steel and 50,000 cubic yards of concrete.

Personnel

For Merritt-Chapman & Scott Corp., William Denny is Project Manager on the construction of the Elizabeth River Tunnel. Ralph E. DeSimone is Vice President in charge of the company's Marine and Heavy Construction Division.

Parsons, Brinckerhoff, Hall & Macdonald, the consultant engineers on the tunnel, are represented by George J. Murphy, Resident Engineer.

The Elizabeth River Tunnel Commission is headed by Gen. James A. Anderson, Chairman, who is also Commissioner of the Virginia Highway Department. The Executive Director of the Commission, Thomas P. Thompson, is in active charge of all phases of contract negotiations between the Commission and its contractors and engineers.

New Ten-Ton Crane With 1/2-Yard Bucket

The new Model 1014 truck crane engineered by Unit Crane & Shovel Corp., Milwaukee 14, Wis., has a lifting capacity of 10 tons, and a ½-yard capacity as an excavator. Equipped with a 35-foot boom its weight is in excess of 35,000 pounds. The 1014 carrier is a heavy-duty 3-axle tandem-drive unit. One-man control can be applied with the addition of air-power steering.

Standard power installations are a Waukesha 6 MZA in the chassis and a Waukesha 195 GK overhead-valve engine in the upper structure. Diesel installations are GM, with a 2-cylinder in upper, 3-cylinder in chassis. Independent boom hoist is optional. The unit has 5 speeds forward and 1 reverse, with a 2-speed auxiliary transmission extending the total speeds to 10 forward and 2 reverse. Road speed is rated at 32 mph. A 2-position mounting of the upper structure is available: forward position for maximum crane capacity or rear position for maximum working range in excavating operations.

The Unit 1014 truck crane has a lifting capacity of 10 tons and a capacity of ½ yard as an excavator. It is equipped with a 35-foot boom.

Other features of the machine include a newly designed hook-roller construction. Twin hook-rollers are equalized and mounted on the front and rear of the rotating frame. They may be quickly adjusted by means of an eccentric pin. Four upper load-rollers and 4 adjustable hook-rollers contact a single flange on the combined roller-path and internal circle gear. A one-piece cast gear case provides a complete enclosure for all gears and bearings. Gears and splined shafts are drop-forged alloy-steel. Disk-type clutches are interchangeable. Engines are mounted straight-in-line with the main machinery, and all power shafts are mounted on either ball or tapered roller bearings.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 19.

Film on Garrison Dam

A documentary film on Garrison Dam has been released by The Euclid Road Machinery Co., Cleveland 17, Ohio. In its 20-minute running time it presents scenes of the flood and drought which have repeatedly brought disaster to the Missouri Basin, and tells the story of earth-moving and construction phases.

If you are interested in showing "The Garrison Story", address the Euclid Sales Development Department.

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AGC Reviews 1950 Construction Year; Nominates Officers

The Governing and Advisory Boards of The Associated General Contractors of America met September 11-13 in Chattanooga, Tenn., and nominated officers for 1951. Glenway W. Maxon, 1950 Vice President, was nominated for President in 1951, to succeed Walter L. Couse, Detroit, Mich. Gayle G. Armstrong was nominated for 1951 Vice President to succeed Mr. Maxon.

Mr. Maxon is President of Maxon Construction Co., Inc., Dayton, Ohio. He has been Chairman of the AGC Heavy Construction and Railroad Contractors' Division and of the Legislative Committee. Mr. Armstrong heads the highway contracting firm of Armstrong & Armstrong, Roswell, N. Mex., and has been active in AGC affairs. Formerly Chairman of the Highway Contractors' Division and President of the Associated Contractors of New Mexico, he is now Chairman of the Public Relations Committee.

In a speech which opened the meeting, President Couse said official estimates predict that "more than $26,000,000,000 of new construction will be put in place this year. Maintenance and repair operations are expected to amount to approximately $9,000,000,000 . . . So far as can be seen at this time, the volume of defense construction . . . required by the partial mobilization program will not be a too significant figure in comparison to the total volume of construction expected for the year."

In a discussion of national defense, H. E. Foreman, Managing Director of the AGC, and President Couse reviewed the action which the Association has taken. A Committee on National Defense has been appointed and has met with government agencies responsible for defense construction; the AGC has been asked by the National Security Resources Board to assist in the planning of a disaster relief program; and the AGC will continue to cooperate with the Army and Air Force in the Army Affiliation Program under which AGC chapters and branches have sponsored 83 reserve construction units. A number of these are being called to active duty.

The Governing and Advisory Boards made the following recommendations based on the AGC's experience in defense construction during World War II, and on results of its recent survey of construction conditions which indicate rising prices and growing shortages of manpower and equipment. (1) That defense construction be performed through normal industry channels, with fixed-price contract awards after competitive bidding. (2) That subcontractors and sellers of machinery and materials submit firm prices wherever possible. (3) That all steps be taken for greater production, the maintenance of wage rates for agreed-upon periods of time, settlement of jurisdictional disputes without wage stoppages, and training adequate numbers of apprentices.

Fred I. Rowe, Chairman of the Membership Committee reported that the AGC now has 5,650 members. H. B. Alexander, Chairman of the Committee on Accident Prevention, said that a 50 per cent increase in participation in AGC's safety contest this year indicated a growing interest in accident prevention.

It was decided to hold the 32nd AGC Annual Convention February 26 to March 1 at the Statler Hotel, Boston, with the AGC of Massachusetts as host. The midyear board meeting next year will be held in the vicinity of Chicago.

Officers of the Associated General Contractors of America, Inc., take a minute to glance at reports of their midyear meeting in the Chattanooga newspaper. From left to right: H. E. Foreman, Managing Director; Gayle G. Armstrong, nominee for 1951 Vice President; Glenway W. Maxon, Vice President and nominee for 1951 President; and President Walter L. Couse.

Lighting Up a Night Job

A detailed report of the Corps of Engineers study on night-work lighting systems for construction equipment has recently been prepared by the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. It lists the advantages gained by proper placing of lighting equipment directly on the construction unit. The book is fully illustrated with photogarphs of typical installations, and it contains a large number of engineering drawings. It costs $3.75.

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Five-Mile Dual Road Is Graded in South

Job Awarded to a Whistler, Ala., Contractor Is the Start Of Needed Betterment on Road to Miss. State Line.

✦ ONE of the most heavily traveled roads in Alabama, U. S. 90 from Mobile west to the Mississippi state line, is being improved to accommodate with safety the great volume of Gulf Coast traffic that it carries. The first step in this long-needed betterment is the construction of a 5.7-mile section of dual highway on new location, beginning immediately west of Mobile and extending to Theodore. Only grading and drainage is included in this first-stage construction contract which the Alabama State Highway Department awarded to L. L. Jarrell, a Whistler, Ala., contractor, on his low bid of $215,000. Baird & Latimer of Selina, Ala., was awarded a contract for three bridges at $107,000.

Work got under way on this initial project in December, 1949, with the clearing and grubbing of 190 acres of new location over a roadway strip lying north and west of the existing highway. The right-of-way is of fairly uniform width, with a minimum of 250 feet and a maximum of 265 feet, ample enough for the dual highway. A 30-foot raised median strip with a parabolic crown separates the opposing roads of traffic. The raised section has a maximum height of 8 inches.

Each roadway will carry a 24-foot pavement, crowned ¼ inch to the foot, and flanked by 10-foot shoulders sloping ½ inch to the foot. On fills up to 10 feet in height, the sideslopes are 4 to 1; fills over 10 feet high have 2 to 1 sideslopes. In cut sections the slope from the shoulders is 4 to 1 for a width of 8 feet to a ditch 3 feet wide and from 1 to 2½ feet deep. Backslopes vary in cuts from 2 to 1 to a flat 10 to 1.

While no paving is included in this present contract, the ultimate improvement will consist of an 8-inch sand-clay base course for topping material to support a bituminous pavement. The pavement will probably be a double bituminous surface treatment and a layer of plant-mix asphaltic concrete.

New Location

The right-of-way on the new location was made up of both open country and woods. Near the eastern end of the job the alignment cuts through a densely overgrown section of Rag Swamp for a distance of 3,000 feet. The thick, almost impenetrable swamp had a reputation some years back as a haven for local moonshiners and fugitives from the law. Clearing of the heavy growth was speeded by felling the larger trees with a Mall and a Henry Disston power chain saw. Three tractor-dozers—a Caterpillar D8 and two Internationals, a TD-18 and TD-14—dozed the brush into piles for burning.

L. L. Jarrell handled the grading, pipe work, and the smaller drainage structures. The three reinforced-concrete bridges let to Baird & Latimer range in length from 22 to 170 feet. Work on the bridges necessarily divided the grading operations into sections, but on the whole the material balanced out well with only one borrow pit required to complete the embankments. This single pit adjoined the roadway; about 50,000 yards were taken as borrow.

Material over the job was either sand or clay, with the bulk of the excavation running to sand. No rock or hard digging was encountered. The deepest cut on the 5.7-mile contract was 20 feet, and the highest fill was 25 feet.

Grading Operations

On short hauls averaging 500 feet, the contractor employed tractor-scraper units. These included two TD-18's pulling LeTourneau LS Carryalls averaging 8 yards a load; and a TD-14 pulling an Adams 6-yard scraper. For the longer hauls, up to 3,500 feet, dirt was moved with rubber-tire equipment. This fleet included one LaPlant-Choate motor scraper—14 yards struck and 17.5 yards heaped; three Super C Tournapulls with LP Carryalls—12 yards struck and 15 yards heaped; and four Caterpillar DW-10's with No. 10 scrapers—8 yards struck and 11 yards heaped.

For loading the dirt-moving machines, three push tractors were on hand—a D8, a TD-24, and an Allis-Chalmers HD-19. Fills were built up in 8-inch lifts and were compacted by sheepsfoot rollers that operated continuously during the placing of the embankments. Two Bros sheepsfoot rollers were on hand, one pulled by an ID-9 and the other by a Case rubber-tire

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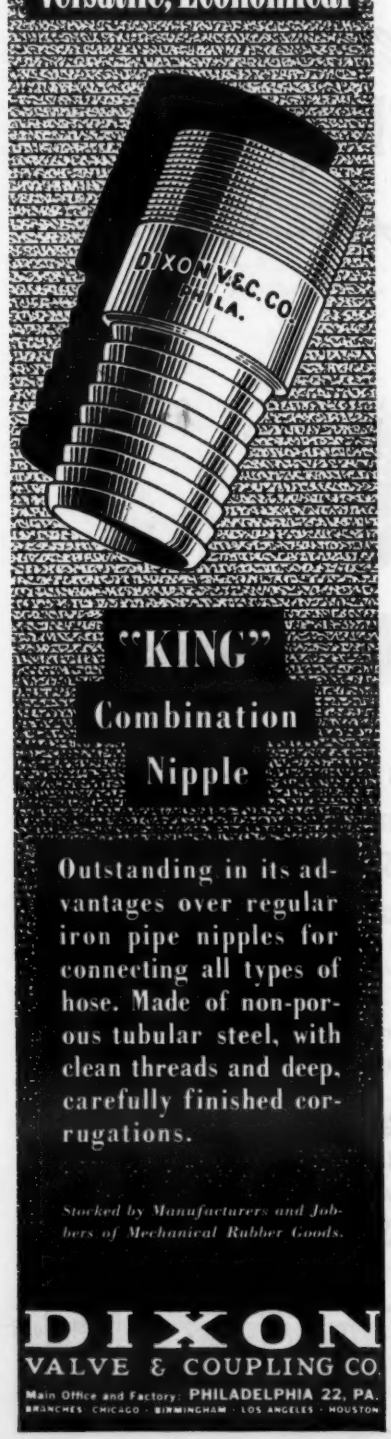
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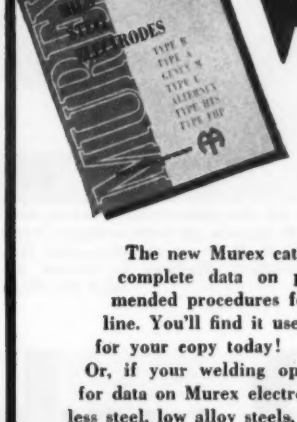

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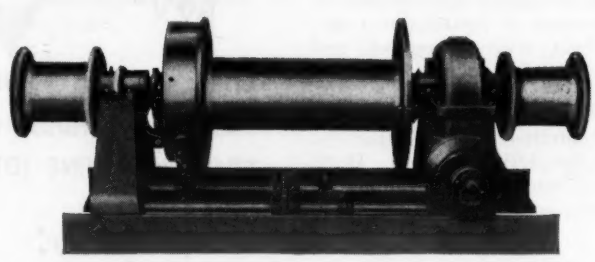

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C. & E. M. Photo
A Disston power chain saw cuts a 10-inch gum in Rag Swamp.

tractor. Final shaping of the roadbed was done by a TD-9 dozer and a Caterpillar No. 12 motor grader. The crawler-tractor and scraper units were also used in shaping the ditches and slopes. As most of the dirt was moved through the rainy winter and spring seasons, the material was sufficiently moist so that no water had to be added to the embankment fills in order to get the desired compaction.

Fuel for the equipment was supplied by Cities Service Co. and Standard Oil Co. (Ky.), tank trucks from Mobile making delivery to the job. Units were loaded from the trucks, and a 600-gallon fuel tank was also kept at a central point to all operations. Equipment was shifted about from one part of the contract to the other on a Dorsey trailer towed by a White truck-tractor. With the above fleet of dirt-moving machines, the contractor averaged 7,000 cubic yards of material in a 9-hour day. Personnel ran about 50, including a crew of about 25 engaged in the land-clearing operations.

Swamp Work

About 2,500 linear feet of swamp with muck varying from 0 to 11 feet had to be crossed. The original plans called for digging drainage ditches to the hardpan down each right-of-way line with the idea of draining and stabilizing this muck, then building the fill over the area. Two Northwest draglines, Models 25 and 15, equipped with Wellman 1-yard and ½-yard buckets respectively, and 35-foot booms, finished one of the ditches, but it became apparent that this plan would not prove satisfactory, so it was stopped.

At a conference on the site, between representatives of the Alabama Highway Department, the Bureau of Public Roads, and the contractor, it was decided that this muck area would be liquefied by blasting with dynamite, using approximately one pound of 50 per cent dynamite for each cubic yard of muck. After blasting, a predominantly sandy material would be hauled in and back-dumped, forcing the liquefied muck out ahead and to the sides.

This new development will add about 100,000 cubic yards to the excavation item, and push back the date of completion a couple of months. The present grading contract was expected to be finished by September. The delay is of no significance since considerable work has still to be done on the remainder of U. S. 90 to the west. A 3-mile grading contract will be let adjoining this Jarrell job. That link will tie the new location back to the old road. From that point near Theodore to the Mississippi state line, nearly 15 miles, the existing pavement will be widened 3 feet on each side, making the width 24 instead of the present 18 feet. Shoulder width will also be increased to 10 feet, thus providing U. S. 90 with a 44-foot roadway. In addition a dangerous curve will be eliminated at Grand Bay, and several old bridges will be replaced with modern structures.

Quantities and Personnel

The major items on the 5.7-mile dual-highway grading contract included the following:

Clearing and grubbing	190 acres
Common excavation (plus about 125,000 cu. yd. overrun)	400,500 cu. yds.
Concrete for structures	2,132 cu. yds.
Reinforcing steel	391,070 lbs.
Concrete pipe, 15 to 60-inch	3,788 lin. ft.
Pipe underdrain, 6-inch	2,000 lin. ft.

L. L. Jarrell, the contractor, was represented on the project by Bill Bouler, Superintendent. For the Alabama State Highway Department, T. G. Drinkard was Project Engineer. The job is located in Division 6 of which Herman Orr is Division Engineer with headquarters at Grove Hill. The Department is headed by Ward W. McFarland, State Highway Director. Marvin Taylor is Construction Engineer.

C. & E. M. Photo
Before it was decided to blast muck out of Rag Swamp on the Jarrel job, this Northwest 25 dragline with a Wellman bucket dug a drainage ditch there to draw off the muck.

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SUSTAINED EARNING POWER—*that's Mack*

• Wherever there's earth or rock to be moved...wherever there's need for *extra* performance, *extra* stamina, *extra* dependability—there you'll find a job that's made to order for a Mack.

Mack's proved superiority in earth moving work rests on *built-in superiority* of design and construction. In addition to their inherent power, strength and durability, Mack trucks bring you outstanding advances in maneuverability, ease of control, positive traction and maintenance accessibility.

Follow the lead of profit-wise operators who have discovered from actual experience that when it comes to working harder, lasting longer and operating at lowest cost—there's nothing to equal a Mack. Your nearest Mack branch or distributor will give you the full story on what Mack's *sustained earning power* can mean to you in greater profits through greater output at lower cost.

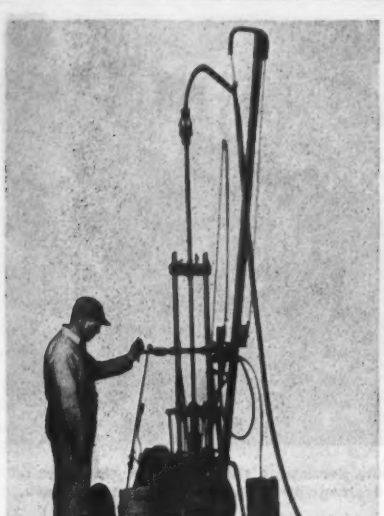
Be Profit-Wise
Modernize with

Mack TRUCKS

B416

...outlast them all

Mack Motor Truck Corporation, Empire State Building, New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.



Soil sampling, prospecting, and blast-hole drilling are the main uses for the new Hossfeld rock drill.

Portable Rock Drill Obtains Soil Samples

The new lightweight portable rock drill developed by Hossfeld Mfg. Co., Winona, Minn., is designed for soil sampling, prospecting, and blast-hole drilling. The prospecting attachment pumps water through the hollow drill steel and recovers the cuttings for sampling at any depth level during the drilling operations.

The pneumatic wheel-mounted drill will cut holes from 1¾ to 2⅝ inches in diameter and to a depth of 70 feet. Screw-on detachable rock bits to fit the solid drill steels can be furnished in standard stock sizes. The company says the drill will maintain precisely the diameter of the bit for the full depth of the hole. Its compactness and portability make it convenient for getting into areas inaccessible to larger drilling rigs, Hossfeld adds.

Power is furnished by a 5-hp air-cooled 4-cycle gasoline engine, which drives a 60-pound 16-foot drill on a 7½-inch stroke, delivering 350 direct drilling blows per minute. Drilling speeds vary with the material. The company reports penetrations of 4½ inches per minute with a 1¾-inch bit in lime-rock formations and 12 inches per minute using a 2½-inch-gage bit in shale. Fuel consumption is said to be 4 gallons of gasoline for a 100-foot drill in hard limestone, and the water requirement about 2 barrels for each 100 feet. The Hossfeld rock drill may be used for testing footings for bridges, buildings, roads, etc.; prospecting for gravel, limestone, sandstone, etc.; or for straight blast-hole drilling.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 87.

Field Kit Converts Diesels to Gas Fuel

Recognizing that natural gas has features and economies equal to and sometimes better than diesel fuel in some engine services, the Waukesha Motor Co. of Waukesha, Wis., recently announced a kit for quick field changeovers from diesel fuel to natural gas (or vice versa) for its Models 6-LRD and 6-WAKD diesel engines.

"The field conversion kits are so simple to use that the operating or maintenance engineer on the job can do the work", Waukesha says. "Furthermore, engines may be converted over and back as often as required, and no additional expense is entailed beyond the first cost of the kit".

Both the 200-hp 6-WAKD and the 300-hp 6-LRD are converted to gas operation or back to diesel without any internal engine changes. The kits provide gas cylinder heads together with the necessary ignition and carburetion equipment. A spokesman for the Waukesha Motor Research Department states that the use of interchangeable cylinder heads to alter the compression ratio was proved, after extensive experiments, to be superior to other methods of conversion. It is said that the time required for the changeover is a minimum, and that when the conversion is completed optimum performance is obtained with either fuel.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 27.

Indian International Engineering Exhibition

The Fourth Congress on Large Dams, the Sectional Meeting of World Power Conferences, and the Meeting of the International Association of Hydraulic Research are scheduled to take place in New Delhi, India, during January, 1951. A meeting of the newly formed International Commission on Irrigation and Canals during this period has also been proposed.

In connection with the conferences, the Indian Ministry of Works, Mines, and Power will conduct an engineering exhibition at New Delhi. Live and still models will show the latest developments in the sciences and the techniques covered by the conferences.

Information on the conferences and exhibition may be obtained from K. C. Chacko, Consulate General of India, 3 E. 64th St., New York 21, N. Y.

ONLY ANTHONY "Super" HOISTS give you all these DUMP BODY advantages!

AND WITH ALL THIS EXTRA VALUE THEY ARE PRICED WITH THE LOWEST!

These and 10 additional features fully described in Catalog LD 748—no obligation, write for your copy.

SEE YOUR TRUCK DEALER HE HAS VALUABLE LITERATURE FOR YOU

1. "Non-thrust" Roller Bearing Pump patented design stops pump troubles.
2. "Balanced" Piston type control valve non binding, free action, creep proof.
3. Double "I" members supports lift mechanism—protects truck frame.
4. Double Arm "Power-Speed" Hoist—Super Power leverages changing to speed for faster dumping cycle.
5. Double shafts stabilizes lift, permits flexibility, adds life to hoist frame.
6. Massive rear body braces greater strength.
7. 3 Pyramid Braces on sides supports larger area.
8. Body rolls 3½" wide—will stand a terrific beating.
9. Telescopic tipping frame gives full structural strength with 3" lower mounting height.
10. Extra large Piston Shaft gives added protection and strength needed for "Spreading" operations.
11. Cylinder, seamless steel, fitted with blow-out Proof Cylinder head.

The value of your Anthony Distributor can't be measured merely by the money he saves you—Call him for prices, delivery and service on Dump Bodies, Hoists, Lift Gates, Material Spreaders and other truck equipment.

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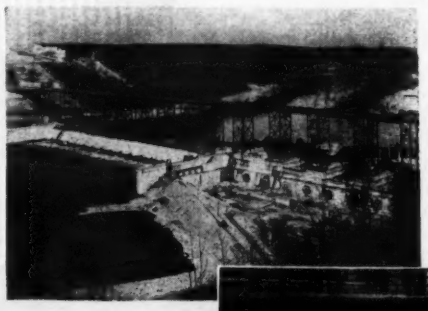

FULCO COTTON CONCRETE CURING MATS

ON THE JOB

at the mammoth Bull Shoals Dam. Constructed by the Ozark Dam Constructors under the supervision of the U. S. Corps of Engineers, Bull Shoals is one of the most massive concrete dams in the U.S. Concrete is at its best when cured with Fulco mats. They stay wetter longer, insulate against sudden temperature changes, increase curing efficiency and the subsequent flexural strength of the concrete. Sturdily made of tough cotton with stitched edges and seams, filled with high grade cotton padding, Fulco mats may be used over and over again, making the cost per job negligible. See your equipment dealer for prices or wire direct.

Fulton also manufactures sturdy, top quality Triple Strength Tarps, drop cloths, and tents. Indispensable protection at economical prices.

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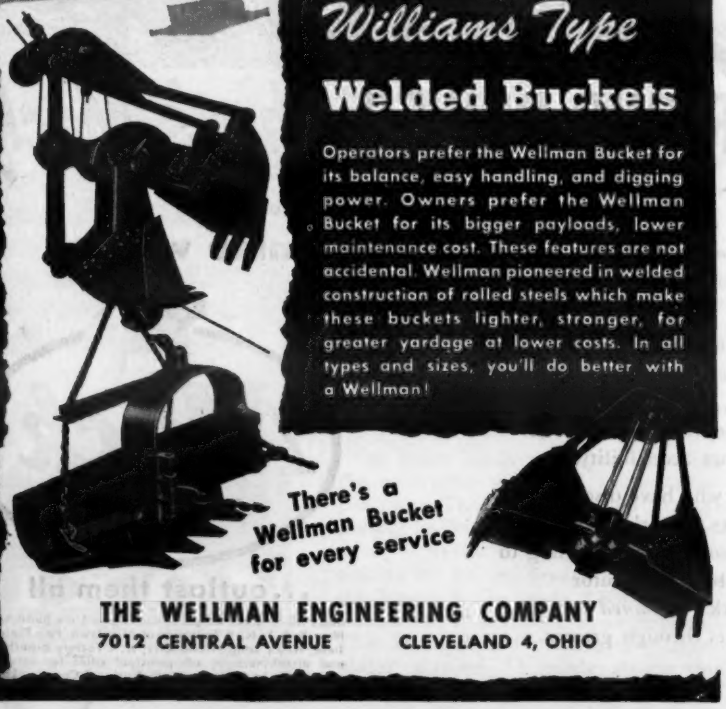
Williams Type

Welded Buckets

Operators prefer the Wellman Bucket for its balance, easy handling, and digging power. Owners prefer the Wellman Bucket for its bigger payloads, lower maintenance cost. These features are not accidental. Wellman pioneered in welded construction of rolled steels which make these buckets lighter, stronger, for greater yardage at lower costs. In all types and sizes, you'll do better with a Wellman!



There's a Wellman Bucket for every service

THE WELLMAN ENGINEERING COMPANY
7012 CENTRAL AVENUE CLEVELAND 4, OHIO

Small Rigs Speed Roadside Project

Contractor Seeds 3 Miles; Sods 300 Squares per Shift By Using Small Equipment And Clever Organization

♦ SMALL equipment and good organization, coupled with good weather, have made it possible for a Davenport, Iowa, contractor to show exceptional speed on 22 miles of roadside erosion-control work on U. S. 6, east of Des Moines. Chalupa Bros., specialty contractor, seeded up to 3 miles of highway and laid as high as 300 squares of sod in a 10-hour shift.

The firm is noted throughout the state for its job organization, good equipment, and dependability. Men on the water trucks were as interested as state inspectors in insuring the start of new sod growth.

Chalupa Bros. received the Iowa State Highway Commission contract for seeding, sodding, and mulch in line with the policy of letting such special work to contracting firms equipped to do it. For many months U. S. 6 has undergone major face-lifting between Des Moines and Newton. Through its erosion protection, Chalupa Bros. rounded out the major widening and hot-mix resurfacing which another contractor, Hargrave Construction Co., had done.

The first 7 miles was finished before the seeding season ended in May, so the Chalupas sowed a nurse crop at that time to help keep down the weeds. Nurse crops in Iowa usually consist of 1½ bushels of oats per acre in spring: 1 bushel of rye after August 20.

In late July, the firm finished a job near Eddyville, Iowa, and moved north to demonstrate its speed a little nearer the state capital.

Normal Sequence

Normally, if the season is right, Chalupa Bros. follows a set routine. The entire area to be seeded is first prepared and then sown. Straw mulch is then brought in and placed. Sodding is usually the last operation.

This had to be reversed slightly, because late July is out of the regular seeding season. From May 28 to August 7, Iowa will not permit its contractors to sow the 15 pounds of brome, 5 pounds of alfalfa, 3 pounds of red clover, and 2 pounds of alsike clover which its specifications call for per acre. During this season, however, ditches can be shaped and sod can be cut and placed.

C. & E. M. Photo
An Oliver HG crawler tractor with an Imp dozer blade roughs out a ditch line along U. S. 6 in Iowa.

C. & E. M. Photo
Chalupa Bros. often uses this Ford-drawn Hydro Scraper to help shape the bottoms of ditches on its jobs.

Grading and ditching was the first operation when the Chalupas moved in. Normal roadside ditches were built with a 4-foot flat bottom, although some were wider. These ditches were first roughed in by a pass or two with a small Model HG Oliver crawler tractor equipped with a 4-foot Imp bulldozer blade. This machine had standard-width tracks and was able to get down along the ditch lines in all places.

A Ford rubber-tire tractor with a small tail blade then moved in to shape the ditches to a finer polish. One of the most important rules about ditch con-

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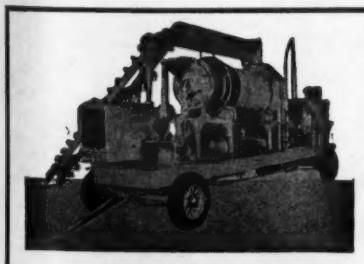

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Complete units for pavement maintenance. Capacities—4, 8, 12, 25 tons per hour.

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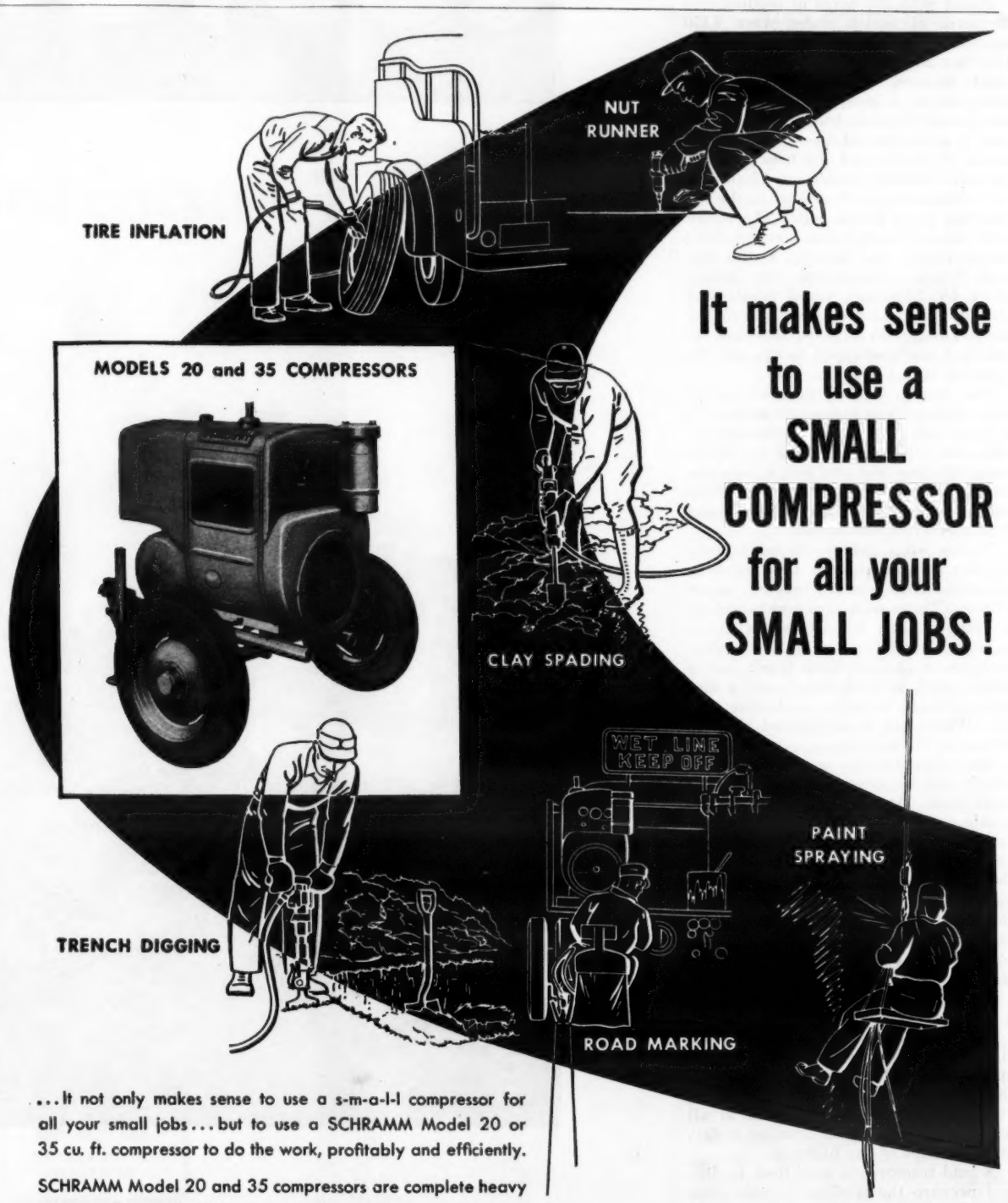

It makes sense to use a SMALL COMPRESSOR for all your SMALL JOBS!

...It not only makes sense to use a s-m-a-l-l compressor for all your small jobs... but to use a SCHRAMM Model 20 or 35 cu. ft. compressor to do the work, profitably and efficiently.

SCHRAMM Model 20 and 35 compressors are complete heavy duty gasoline engine driven units embodying the same features and designs of the large SCHRAMM Compressors, including:—

- Push Button Electric Starter
- Battery and Battery Charging Generator
- Mechanically Operated Intake Valves
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- No Belts, Gears or Other Transmission
- Control Panel with All Instruments

SCHRAMM INC.
The Compressor People
WEST CHESTER • PENNSYLVANIA

Small Rigs Speed Iowa Roadside Project

(*Continued from preceding page*)

struction is that the bottoms have to be flat so running water cannot have a V in which to start erosion. The tail blade, which also erases the tractor tracks, proved to be a valuable tool.

Treatment by these two machines was sufficient, in about 75 per cent of the cases. The remainder of the time, for one reason or another, limited hand work had to be done. If the ground was uneven and hard, it was almost impossible to finish the grade. A small Hydro Scraper on a Ford tractor often helped, but in the toughest places hand labor was the final touch, as much as the firm tried to get away from that method.

To make this hand raking easier, a small M-E rotary tiller made a pass or two, and raking was then easy.

Sodding Comes Next

Along with 195 acres of seeding and 63 acres of mulch, there were 4,150 squares of sod in this project. Ordinarily Chalupa Bros. cuts its own sod with a small 15-inch shop-built steel cutter, mounted on a reciprocating eccentric on a small Gravely tractor. For business reasons the sod was purchased for the U. S. 6 job, and the man who cut it used a similar machine to Chalupa's.

For the 4-foot-bottom ditches, the sod was put up in 7-foot rolls. The cutter took the sod up in a thin layer, making an attempt to cut through at the root line. Precise sod cutting was helped along by Chalupa's usual practice of cutting the grass first, and then rolling the sod area with a 1,000-pound smooth roller. It was then easier to cut, and the material rolled better.

Two trucks hauled the sod to the site, often with as high as 60 squares in a truckload. While men unloaded the sod rolls, other men carried it over to the ditch line and two sod layers unrolled and placed the bundles. This operation went so fast that 300-square days were not uncommon.

To keep the sod moist and to help it start growing in the new location, Chalupa Bros. used several water wagons. There were two truck-tankers on this project: a 1,500-gallon Ford-mounted machine, and a 2,300-gallon tank on a Dodge. Each truck had a small pump to load water, and a discharge pump to help in flooding the sod. Water had to be hauled about 4 miles, on the average.

The Chalupas use a watering trick which may be somewhat more efficient than usual. At the first watering, the nozzle man washes all the loose dirt he can down into the sod cracks. If any earth ridges are left he makes sure that material is sluiced down. It not only helps hydraulically to dress the slope, but the sod seems to start earlier and do better. Periodic soakings are continued until the rains and Mother Nature can take over.

Seeding Is a Show!

According to everyone in the Iowa Highway Commission who has seen the operation, Chalupa's seeding is something to watch. With machines strung out in good order, it was not at all unusual to seed about 3 miles a day, on both sides of the highway.

A lead tractor was used first, to disk and prepare the seedbed. It was often 3 to 4 miles out in front of the back end of the operation. Following the lead machine closely was a man who sowed the nurse crop. Another man then made a final inspection of the site, and threw away any debris such as sticks, large rocks, or other debris.

A Brillion pulverizer then worked over the area, pulverizing the soil and making it ready for the seed grasses and legumes. These were placed by an Ezee-Flow seeder, and another pass was made by the pulverizer.

C. & E. M. Photo

Working rapidly, the Chalupa sodding crew unloads a heaped truck and spreads the material in a roadside ditch.

In all areas subject to rain erosion, the seeded area was then protected by a straw mulch. Here again the contracting firm demonstrated its ingenuity. It bought a repair truck, equipped with a crane, from a telephone company. The crane was then equipped with a hay-lifting fork. Three men could load a truck with straw from a loose straw pile in about 20 minutes, where formerly it had been a 3-hour job for 6 men.

The straw mulch was also placed by one man, who used a wide-tread Oliver HG crawler tractor and an improved manure spreader specially equipped to scatter straw, instead of the more pungent-smelling commodity.

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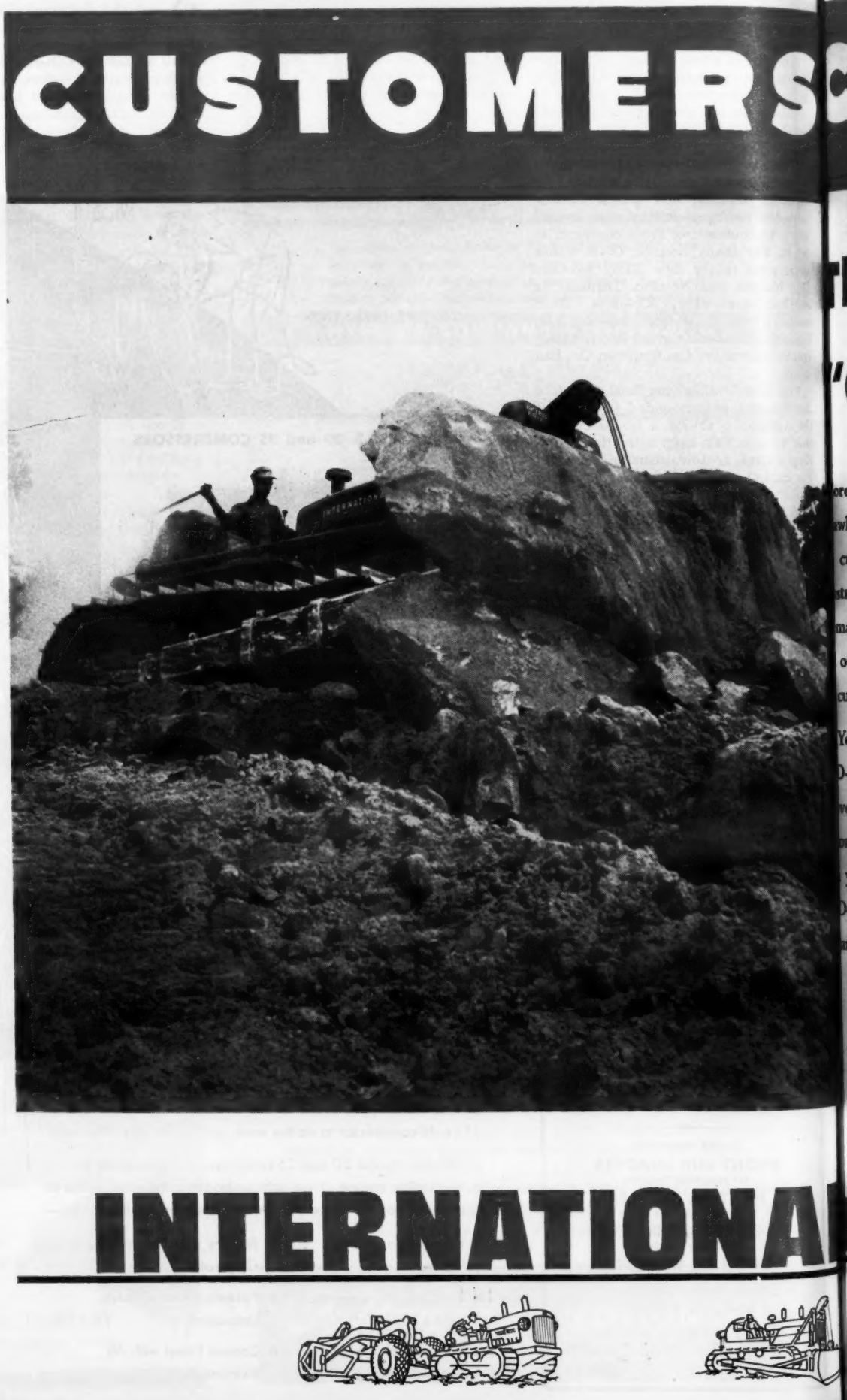
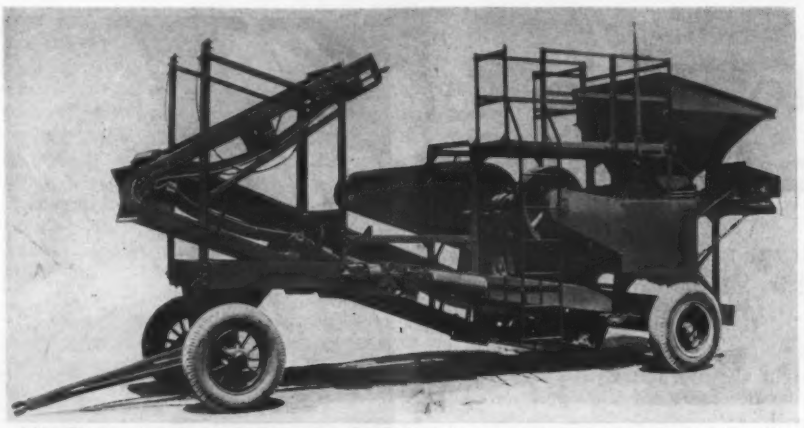


Straw mulches were not rolled, although the firm is conducting some experiments on a new-type disk which may help to set the straw in the soil on a later job.

Iowa's entire roadside-development program is a common-sense soil-conservation measure of the type exemplified by this job. Low-growing grasses and legumes protect the right-of-way and prevent erosion. Sodded ditches and waterways are secure from scour. The erosion-control work never interferes with sight distance, and maintenance costs have been reduced on these jobs.

Fred R. White, Chief Engineer, headed the supervisory organization in charge of the work, and Dudley Chittenden was Landscape Engineer.



The Pioneer No. 6 single-pass crushing plant is mounted on a 2-axle chassis with pneumatic-tired wheels. A semitrailer hitch is available.

New Crushing Plant Is Trailer-Mounted

A new single-pass portable crushing plant is announced by Pioneer Engineering Works, 1515 Central Ave., Minneapolis 13, Minn. It has a mechanical (reciprocating plate) feeder and a 2 x 3-foot two-bearing vibrating screen; it may be equipped with a 1016, 1020, or 1024 roller-bearing jaw crusher.

A gathering conveyor which blends the material from the screen and crusher is built into the plant and can be used to load trucks or to deliver to bin or stockpile. V-belts drive the crusher and screen. Other drives are high-speed steel roller chain. The entire No. 6 plant is mounted on a 2-axle chassis equipped with pneumatic-tired wheels. A semitrailer hitch is available.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 52.

Dust-Control Medium Also Stabilizes Soil

A new product for the control and prevention of dust and mud has been brought out by Socony-Vacuum Oil Co., Inc., 925 Grand Ave., Kansas City 13, Mo. It was developed during the war to control dust problems on Army airfields and particularly wherever a low-cost nontracking surface was important. Experimenters found that Dustrol was not only a good dust-layer, but that when properly used it developed a soil surface that prevented mud formation, the company says. Another feature was the marked prevention of erosion by wind and water. The wartime application suggested many peacetime uses such as streets and roads, drive-in theaters, recreational areas, driveways, tennis courts, etc.

Dustrol is a liquid petroleum product refined only at the company's Augusta, Kans., plant. It is offered in three consistency grades to meet various uses. It is not to be confused with paving asphalts or road oils, the company points out. Shipments are made in 6,000, 8,000, and 10,000-gallon tank cars. The Socony Vacuum Co. says that Dustrol does not form a hard brittle surface; that if properly applied to even a poorly compacted base that later settles, the treated surface will not cut through, but is flexible and yields with the soil surface; that it has self-healing properties even when it is cut through, so that the surfaces come together and act to shed water.

Dustrol surfaces are maintained by applying more of the product as needed and allowing it to penetrate. Application is made on a properly drained and aerated soil with a bituminous distributor. Pneumatic-tire rolling usually follows. The company states that the average cost for drive-in theater areas of approximately 22,000 square yards was about 12 to 17 cents per square yard. Application rates vary, depending upon the condition of soil, use, and other considerations.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 77.

Portable Hand Winches

A new circular describing Gold portable hand-powered winches has been prepared by Gold Foundry & Machine Works, 1618 S. Osage St., Independence, Mo. These winches, designed for installation of equipment, hand derricks, jib cranes, gin poles, etc., have capacities up to ¾ ton. The folder outlines their specifications, applications, and prices with or without wire rope and hook. Also illustrated in the circular is a lightweight snatch block.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 4

SCHOICE

The International TD-24
"Champion of Crawlers"

ore than 100 International TD-24 diesel
wler tractors have already been delivered
customers by a single International In-
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You earthmoving men who have chosen the
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ve given the TD-24 its present place of
minence in the industry. You've proved,
your jobs, that there is nothing like the
D-24 for power and performance. You've
nd that this "Champion" pays for itself
quickly, and then gives you *extra earnings* for the rest of its rugged working life.

We are proud of this tractor—the TD-24—and of the acceptance you have given it. And we're proud of the superb distributor organization which has brought this mighty crawler to you—coast to coast.

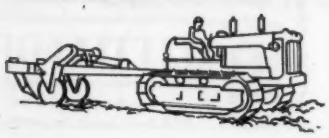
As more International distributors deliver their 100th TD-24 in the months ahead, hundreds more of you who need them will gain the benefits which the great work-capacity and payload production of this "Champion of Crawlers" provides.

INTERNATIONAL HARVESTER COMPANY

INTERNATIONAL HARVESTER

CHICAGO 1, ILLINOIS

INDUSTRIAL POWER



Cotton City to Have Fine Inland Harbor

Dredge Cartagena Pumps Hydraulic Fill to Be Utilized as Industrial Site on Island in Mississippi River

✦ MEMPHIS, TENNESSEE, great cotton city of the south, by 1953 should be boasting one of the finest inland harbors in the country. Such a harbor is now under construction by the Corps of Engineers, U. S. Army, Memphis District, in cooperation with the Memphis and Shelby County Port and Harbor Commission. Authorized by an Act of Congress, the Memphis Harbor Project was approved in July, 1946, and construction got under way in 1948. The total estimated Federal cost is $21,600,000. City and County are providing the right-of-way, and will erect the facilities necessary for the operation of the port.

The project is located about 1¼ miles downstream of the Mississippi River bridges that cross from Memphis west into Arkansas. At this point in the river is Presidents Island, lying close to the left bank from which it is separated by Tennessee Chute. The chute, a by-pass channel of the river, carries from 7 per cent of the total flow at low water to as much as 30 per cent when the river is in flood. The main channel of the Mississippi runs along the opposite side of the island.

Among the main features of the harbor construction is the closing of the chute at its upper end with a hydraulic dam. The top of this closure embankment will provide rail and road access to Presidents Island, large in area but low in height. An industrial site of approximately 966 acres, built with hydraulic fill, will extend downstream along the east and south sides of the island. This industrial area will have an irregular-shaped length of 4 miles, and will average 2,000 feet in width. A dredged channel, 12 feet deep x 300 feet wide, will extend up the former chute from its lower end at the main channel of the river to serve the industrial area. A levee 11 miles long will also be thrown up along the left bank of the river, extending below the harbor project to protect a possible future industrial site south of the city.

Big Fill Job

The closure dam will be 6,000 feet long, and will have a height of 75 feet measured from the bottom of the river, with a 100-foot crown at elevation 245, mean sea level. This embankment will require an estimated 6,400,000 cubic yards of hydraulic fill; sideslopes will be 8 to 1. It will take approximately 48,000,000 yards of hydraulic fill to build up the industrial site on the eastern strip of the island to elevation 240, mean sea level, well above any possible flood stage. The fill will average 20 feet in height above natural ground on the island, and will have 6 to 1 and 8 to 1 sideslopes. Along the industrial site the harbor will be dredged to a depth of 30 feet below low water for a bottom width of 900 feet.

Initial construction on the project included a dredged cut for placement of revetment and willow-mattress protection on the north end of the island to retard the washing action of the river as it sweeps around the bend. This year 5,350 linear feet of permeable pile dikes in three sections is being installed by the Taylor-Wheless Co. of Jackson, Miss., under a $105,840 contract. The dikes will lend further stability to the river side of the industrial-site fill. Another contract for $224,490 to Forcum-James Construction Co. of Dyersburg, Tenn., includes paving the upstream slopes of the industrial embankment with a 5-inch layer of asphalt. The contract totals 21,000 squares of pavement, a square being 100 square feet.

An approach roadway at the east end of the closure dam is also under way. It will extend from Riverside Drive in lower Memphis out to the riverbank to meet the hydraulic-fill embankment. About 1,900 feet of this approach is being constructed as typical cut-and-fill earthwork. A section of the roadway, including 120,000 cubic yards of excavation, was under contract for $32,000 to

(*Continued on next page*)

C. & E. M. Photo

The ladder and cutterhead of the dredge Cartagena.

4 days' work in 3 with JAEGER AIR

Jaeger Model 250 holds full pressure behind 2 heavy rock drills . . . averages 35% more daily footage than with any 210 ft. compressor.

Other Jaeger "new standard" ratings give you comparable increases in production as shown below.

Model 75 runs a heavy breaker or sheeting driver, 2 clay spades or 3 tampers at full pressure. No 60 ft. can do this.

Model 125 runs 2 heavy breakers at full pressure. No 105 ft. can do this.

Model 185 runs 3 heavy breakers or 2 medium rock drills at full pressure. No 160 ft. can do this.

Model 365 runs a heavy duty wagon drill, plus a rock drill or heavy breaker at full pressure. No 315 ft. can do this.

Model 600 runs 2 heavy duty wagon drills at full pressure, which no 500 ft. can do, and has air to spare for auxiliary drilling.

If 30% to 40% more production with the same men and tools sounds interesting, see your Jaeger distributor—or ask us for Catalog JC-8.

See your Jaeger distributor or write

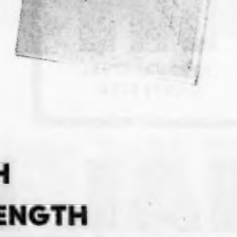
THE JAEGER MACHINE CO.

701 Dublin Avenue Columbus 16, Ohio

PUMPS • MIXERS • HOISTS • TOWERS
TRUCK MIXERS • PAVING MACHINERY

How Does Calcium Chloride *Improve* COLD WEATHER CONCRETE?

"The Effects of Calcium Chloride on Portland Cement" is a semi-technical book that clearly presents the facts on the use of Calcium Chloride. It is filled with graphs, tables, charts and contains much material not heretofore available. This information will be of great interest to contractors, architects, engineers, plant operators and men in allied fields. For your copy, write on your company letterhead to the address below . . . there is no obligation.



SOLVAY Calcium Chloride

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- SPEEDS STRENGTH
- ADDS EXTRA STRENGTH

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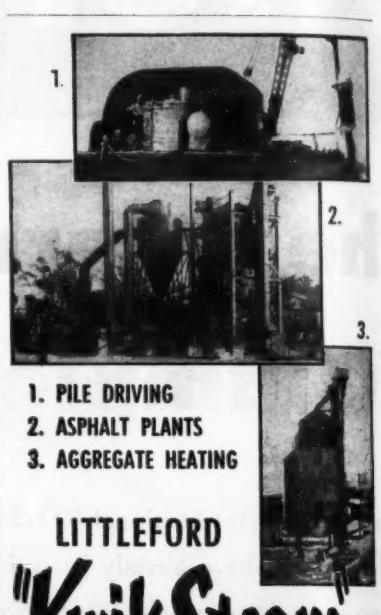

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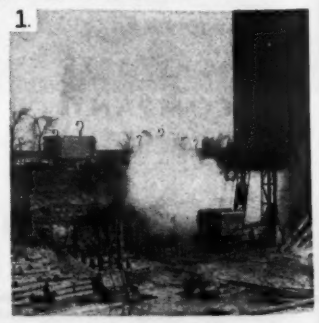


LB LITTLEFORD

LITTLEFORD BROS. INC.
485 E. Pearl Street, Cincinnati 2, Ohio

C. & E. M. Photo
A broken waterpipe for the bearings on the cutter driveshaft of the dredge is welded together.

Cobb & Weaver Co. of Whitehaven, Tenn. Tractor-scraper units moved the dirt. Completion of this contract was scheduled for August.

Dredging

The bulk of the work so far on the harbor project has been done by dredging. Material dredged from the channel for the harbor, and from a cut on the north shore of the island, has been used for building up the industrial fill. Dredging is being done by the Cartagena, a 27-inch cutterhead dredge owned by the Standard Dredging Co. of New York City, and leased to the Corps of Engineers. These early phases of the dredging work are being handled in this manner, rather than by direct contract calling for the placing of so many yards of hydraulic fill, to avoid exposing a contractor to possible financial hazards. For effecting a closure on a large river like the Mississippi is always an unpredictable venture. Obviously contractors would be unwilling to undertake the construction of an embankment in the river that might conceivably be lost through unexpected high water or flood. Standard Dredging employs its own crew, with the Corps of Engineers exercising direct supervision over the work.

The estimated unit cost of the hydraulic fill under the leasing agreement is 19 cents a cubic yard. Once the dam closure is completed, it is expected that the remainder of the fill required for the industrial area will be handled on a yardage contract basis. The closure at the head of the chute is scheduled for completion this year. The Cartagena is expected to pump material across this strip of water from July to December, gradually building up an embankment on 17 to 1 slopes. Once the fill is up out of the water, retaining dikes can be erected along the sides. Material will then be pumped in between the barriers, making the slopes sharper, and reducing the amount of fill required.

Good fill material is available along this stretch of the river, with sand and gravel making up the bulk of the dredging. The silt content is low. In order to save material, pumping for the industrial site was discharged as much as possible into a pool from which the water ran off, leaving the solids behind. There will be a loss of material at the closure, however, where the current through the chute averages 2 mph. Dredging is carried on around the clock, seven days a week, the effective operating time averaging 22 out of 24 hours. The Cartagena averages 2,000 yards of excavation per hour.

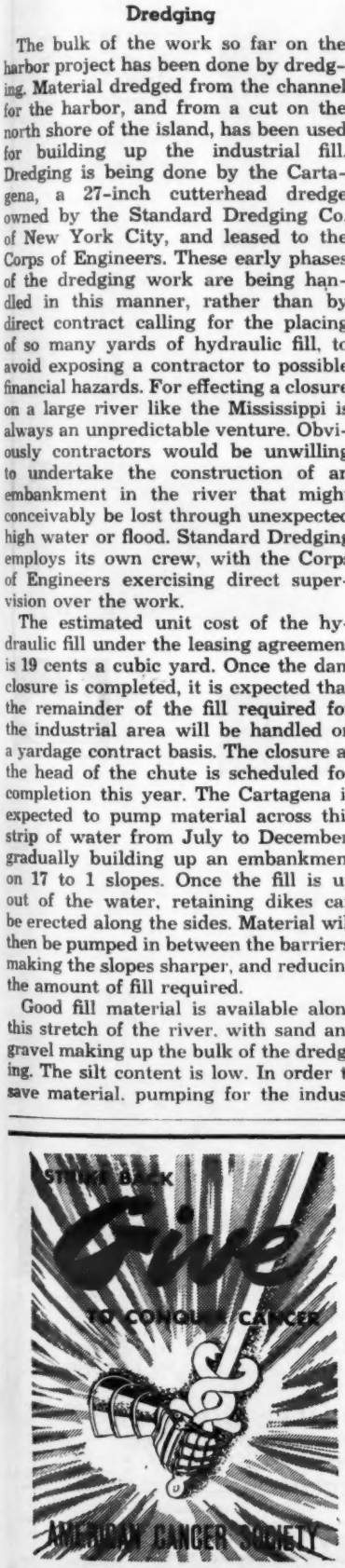
The Cartagena

The Cartagena, named after a port in Colombia, South America, where it had worked, has been rebuilt twice since its launching in 1919. It usually operates out of the New Orleans office of the Standard Dredging Co. The dredge has a steel hull 171 x 48 x 12½ feet, with a draft averaging 10 feet. Above the black hull are two decks, painted gray and white, where the crew is quartered. The three-shift routine requires a crew of 75.

Off the bow is an 83-foot ladder weighing nearly 150 tons, including its shaft and cutterhead motor set up at the dredge end of the ladder. The ladder is hung from a 48-foot A-frame which is tied back to the gallows frame by a pair of 2¼-inch wires on each side. At the end of the ladder is a 6-foot-long by 6½-foot-diameter cutter; both 5 and 7-blade cutterheads are in use on the Cartagena. The cutterhead operates at four speeds—12½, 16, 25, and 32 rpm—being driven by an Elliott 750-hp variable-speed motor through a reduction gear. On this job the maximum depth of digging was around 50 feet. The dredge can reach a 60-foot depth.

(Continued on next page)

C. & E. M. Photo
Discharge from the Cartagena land line shoots out onto the beach.



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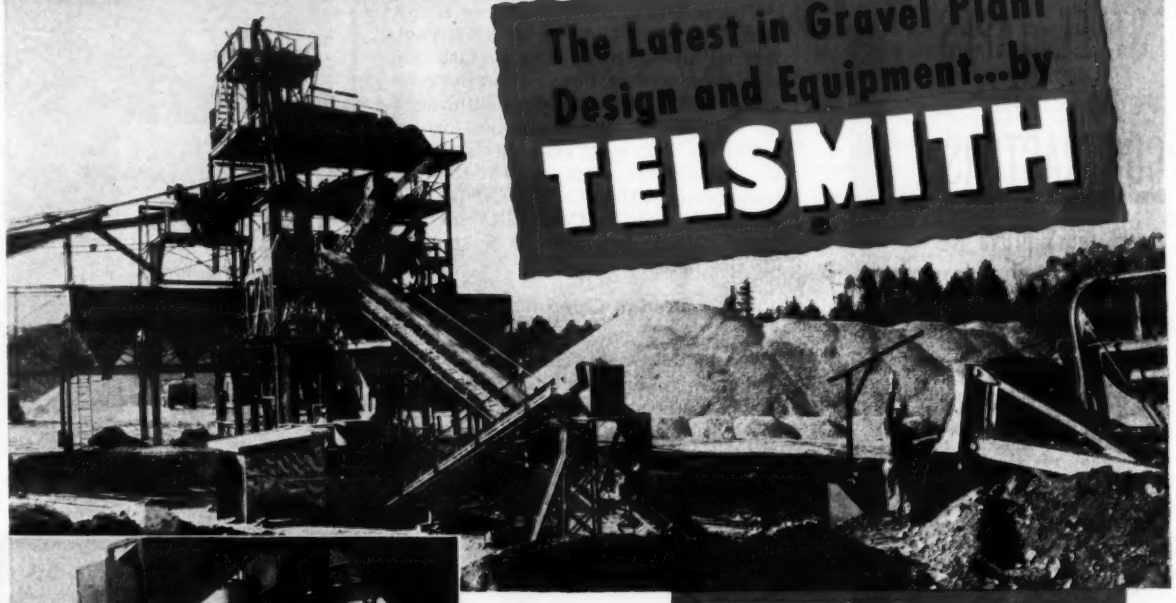
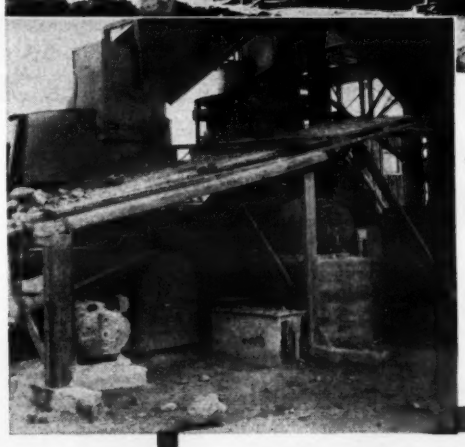
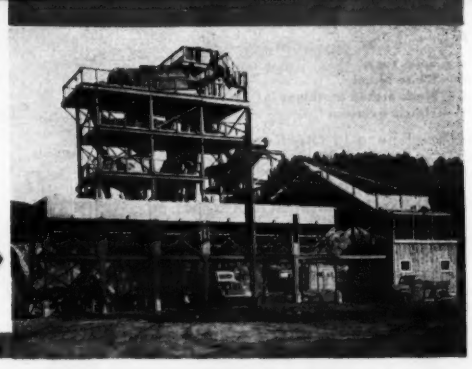




Primary Breaker is a 10-B Telsmith Gyratory Crusher followed by 36" Style S Gyrasphere Crusher

Telsmith Washing Screen, Twin Screw Sand Classifier, and Sand Drag



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Six sizes—two of sand and four of gravel—all meeting the State of Massachusetts Highway Specifications are produced by this modern aggregate plant owned and operated by the General Stone and Sand Corp., of Pittsfield, Mass.

Entirely designed and completely equipped by Telsmith engineers, the plant's planned capacity was 100 tons per hr., but it is regularly turning out 25% to 50% more. It ran the entire first season without one shutdown.

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Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Wilson-Woomer-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.

Cotton City to Have Fine Inland Harbor

(*Continued from preceding page*)

In keepers outside the stern are two spuds 81 feet long, each weighing 45 tons, made of steel plate square in cross section but rounded at the sides with timber lagging to a diameter of 39 inches. Digging is done with the port spud down; the dredge moves ahead by swinging on the starboard spud. Spuds are supported from a steel frame nearly 100 feet high.

Steam-Driven Dredge

The Cartagena is steam-driven. In the boiler room near the stern are two Babcock & Wilcox boilers with 12,000 square feet of heating surface; each boiler is heated by four burners fired with bunker C fuel oil. General regulator equipment controls the operation of the boilers—oil consumption, draft, etc.—according to the steam output. Overboard water is filtered for use in the boilers, while drinking water for the dredge crew is obtained by condensing steam. Average fuel consumption of the boilers is 10 to 13 barrels an hour. Oil is obtained at Memphis from the Standard Oil Co. of Kentucky, and brought out to the dredge in the contractor's steel oil barge measuring 125 x 32 x 8 feet, and holding 3,300 barrels. The Cartagena has storage capacity for the same amount of fuel.

Steam from the boilers drives an Elliott (4,000-hp at 3,600 rpm) steam turbine with a direct connection to the main dredge pump. The pump is of Standard Dredging Co. design with a 30-inch intake and 27-inch discharge. On this job impellers with diameters of 80 to 88 inches, increasing in 2-inch increments, were in use; the runners generally had four vanes. Above the pump hangs a Robbins & Myers hoist for lifting the lid off a manhole from which any obstructions in the intake line may be removed before they reach the pump. From the ladder the suction line enters the dredge hull through a 12-foot-long rubber sleeve connected to a steel pipe opening into the pump. From the pump the discharge line leaves at the port side, gains the deck, where it turns and continues to the stern. There the line makes another turn to leave the dredge through a swivel connection at the center of the stern.

The boilers also drive another Elliott steam turbine, 1,500-hp at 3,600 rpm, hooked up with an Elliott 1,000-kw electric generator. Power from the generator runs the 750-hp cutterhead motor and a Westinghouse 200-hp motor for the swing gear; it also lights the dredge through a 440/120-volt transformer. The Cartagena is also equipped with a Caterpillar 75 kw diesel-driven generator as a standby for the lights.

Dredge Operations

Across the bow, within the deck house of the dredge, is the five-drum Standard winding machinery. The center drum hoists the ladder; the two outer drums raise and lower the spuds; while the two intermediate drums actuate the swing gear. The 1¼-inch swing wire is 800 feet long with 3-ton anchors at the ends. The Cartagena can make a swing of 425 feet, but on this job the average cut is about 350 feet. Anchors are shifted with two anchor barges, measuring 55 x 24 x 5 feet. Each has a 40-foot stiffleg-derrick A-frame and hoists.

With the type of material encountered in Memphis harbor, the dredge pumped an average of 20 per cent solids. As indicated on gages in the lever room, the digging vacuum was around 23 to 24 inches; the vacuum on water pumping only was about 9 inches. Discharge pressure ranged from 100 to 135 psi. Digging depth is read from a gage mounted on the A-frame. The dredge is kept on course with the help of ranges set up on shore.

The floating discharge line has been

(*Concluded on next page*)

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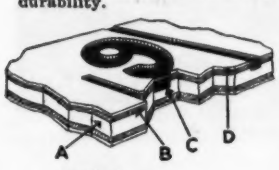
FIRST AND FOREMOST, Roe Steel Tapes are extremely easy to read . . . and they go right on being clearly legible year after year. The black markings are permanently etched into the steel which is then nickelplated to provide a lustrous contrasting background. A transparent plastic overcoating is added for topmost wear resistance—and durability.



A—Steel tape
B—White nickel
C—Black etched markings
D—Plastic overcoat

Pictured here is the Roe Steel Tape #302 with polished chromeplated, sturdy welded steel case. Other Roe models feature cases in handsewn leather, and in metal-banded leather and leatherette. They have a reinforced rust resistant liner, precision winding drum, flush-folding handle, press button center and roller mouthpiece. All are available with 25, 50, 75 or 100-foot tapes; feet in inches and eighths, or in tenths and hundredths.

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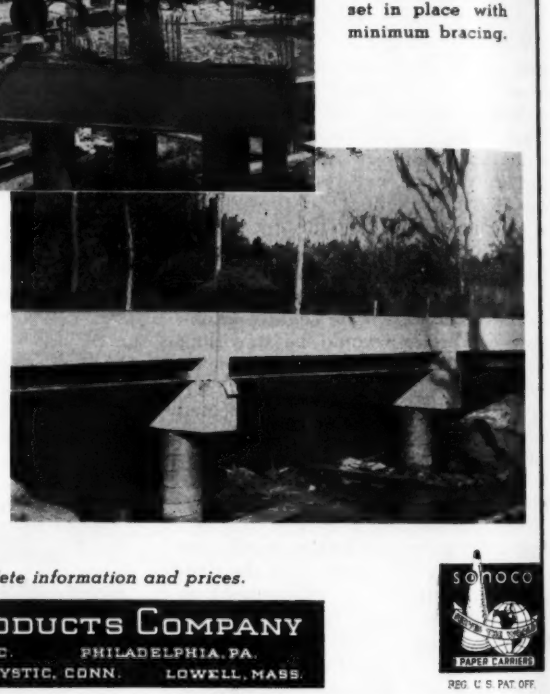

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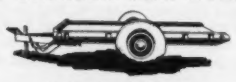
Single Axle Tilt Trailers

Single Axle Trailers

C. & E. M. Photo
In the lever room, Captain Robert G. Coleman points to work ahead for the Cartagena to Chief Engineer Sandberg.

3,000 feet long at times, but usually averages between 1,500 and 2,000 feet. The 27-inch welded steel pipe comes in 50 and 100-foot lengths. Sections are connected with Mobile Pulley ball joints. The pipe is floated on cylindrical pontoons, 60 inches in diameter x 26 feet long, two for each 50-foot length or four pontoons for a 100-foot section. A pair of pontoons are tied together at each end with 10 x 12 timber strongbacks 38 feet long, forming a cradle that secures the pipe in place.

Over the floating line is a 24-inch wooden catwalk with a protecting handrail on one side. The catwalk is lighted, and also carries a phone line by which the dredge keeps in touch with the shore crew. On shore the pipeline is in 15-foot lengths, connected with slip joints. The land line has varied in length from 2,500 to 6,000 feet, and has been fitted out with as many as five Y-connections for spreading the discharge on the beach. A spreader spoon at the discharge end of the pipe prevents rapid runoff and permits the solids to settle out. The retention of solids was also aided by pumping into a pool dug out of the fill.

Auxiliary Equipment

A shore crew of 25 to 30 handled the pipe on land with the help of two tractors, a Caterpillar RD-4 and an Oliver, and an ex-Army half-track. Pipe was transported on a wooden barge measuring 170 x 33 x 10 feet. Parts and equipment were carried on two 100 x 26 x 7-foot steel barges. The 26x9-foot launch Trading served as a crew boat. The two dredge tenders or tugs were the Alice, 54 feet long x 16-foot beam, powered by a Union 190-hp diesel engine; and the May, 45 feet long x 13-foot beam, driven by a Caterpillar 120-hp diesel engine.

Maintenance and repairs are handled in a blacksmith shop at the dredge stern. The sand and gravel material being dredged is extremely abrasive and wearing on the cutterhead, impeller, and pump shell. The facing is rebuilt with Lincoln hard-surfacing rods. Four Lincoln welders are part of the dredge equipment—three stationary electric units and one portable gasoline welder.

Standard Dredging Co. officers on the Cartagena are Captain Robert G. Coleman, and Chief Engineer William M. Sandberg.

For the Corps of Engineers, Earl Houston is Project Engineer on the Memphis Harbor project, assisted by J. K. Patterson. Col. L. H. Foote is District Engineer at Memphis, and Lt. Col. R. C. Bahr is Assistant District Engineer.

Perlite Institute Meets

The Perlite Institute met in St. Louis, Mo., in September, and approved further standardization of perlite plaster aggregate as well as recommendations for the techniques of pouring perlite-cement concrete with or without air-entraining agents. The institute now has 37 members in 21 states.

C. & E. M. Photo
Chief Engineer W. M. Sandberg stands by the Elliott 1,500-hp turbine and generator.

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Wherever there's digging, loading, lifting, carrying, scraping or backfilling to be done, you'll find the Shoveloader performing with speed and efficiency which result in enormous savings in time and manpower.

Specially designed alternate attachments . . . quickly and easily interchangeable . . . greatly increase the Oliver Lull Loader's usefulness. Among them are Combination Coal and Snow Buckets, Concrete Buckets, Log Lifting Forks, Cranes and Backfiller Blades. In addition, a Tilting Lift Tower can be mounted on the Oliver Industrial Model "77" or "88" tractor.

You'll want more information on this cost-cutting, profit-building team. For all the facts, see your Oliver Industrial Distributor or write direct to:

OLIVER MODEL "77" *with Log Lifting Fork attachment on Lull Shoveloader. Useful for handling pipe.*

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Jeep-Mounted Drill Goes Down 100 Feet

A new mobile drill engineered around the Willys Jeep and designed for travel over rough terrain has been announced by Mobile Drilling, Inc., 960 N. Pennsylvania St., Indianapolis 4, Ind.

The Mobile Drill mounts on the back of the Jeep and is powered by the Jeep power takeoff. The combination makes it useful for water-well drilling, shooting overburden, taking soil samples, post-hole digging, and other jobs. An adapter is available for converting it from vertical to horizontal-vertical drilling. The Model B-35 has a range of 3 to 10-inch-diameter holes and depths of 100 feet. The Model B-27 has a range of 3 to 6-inch diameters and depths to 75 feet.

The unit has an overall height of 9 feet. One man can adjust and operate it with ease, the company states. There is no water-supply problem as auger-type drilling does not use water for lubrication even though it is faster than other types of drilling, the manufacturer claims. Hydraulic controls govern the speed and power of hole penetration.

The Mobile Drill mounts on the Willys Jeep and comes in two models: the B-35 digs 3 to 10-inch-diameter holes in depths to 100 feet; the B-27 digs 3 to 6-inch-diameter holes in depths to 75 feet.

When drilling is completed, the unit can be removed from the Jeep. It may also be mounted on a tractor or truck. The sectional augers are equipped with quick-change throwaway bits constructed of a special alloy and tipped with various special coatings for drilling through any material except solid rock.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 44.

For Chipping Operations

Bulletins on a full line of chipping hammers and pneumatic chisels, both blank and finished types, have been issued by the Cleco Division of the Reed Roller Bit Co., P. O. Box 2119, Houston 1, Texas.

The hammers are designed for all types of chipping, caulking, beading, and scaling work. Bulletin No. 75B points out that the hammers are made in 47 different sizes and styles; either the open or closed style of handle may be had, and for the open type, the user has a choice of either a bolt or ratchet locking device. Two different valve mechanisms are available.

A variety of pneumatic chisels for standard chippers and scaling hammers is presented in Cleco's Bulletin No. C-647. Style designations, stock sizes, overall lengths, and stock numbers are given for each product.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 59.

Deep-Well Turbine Pumps

A 20-page booklet illustrating construction details, various types of drive, and typical installations of deep-well turbine pumps has been prepared by The Deming Co., Salem, Ohio.

Although widely used for pumping water supply from deep wells, these pumps may also be used in irrigation systems, air-conditioning systems (where well water is used as the cooling agent), sump pumping, loading tankcars, and other types of pumping operations.

Pumps are furnished for wells with inside diameters of 4 inches or larger. Capacities vary from 12 to 3,000 gpm, and within this range almost any combination of capacity, head, and speed can be obtained, the catalog explains.

This literature may be obtained from the company by requesting Bulletin No. 4700, or use the Request Card at page 16. Circle No. 53.

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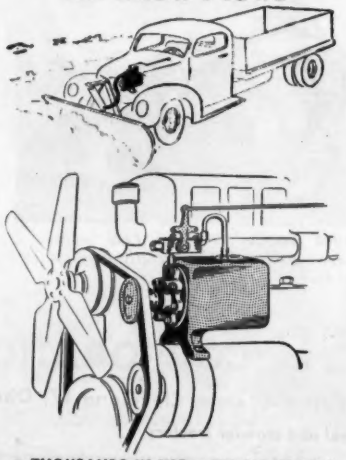

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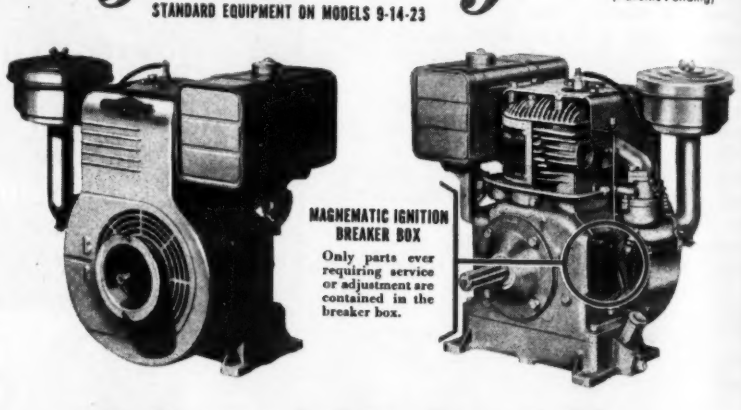

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Magnematic Ignition is another exclusive Briggs & Stratton development which is setting new standards of performance for single-cylinder, air-cooled engines.

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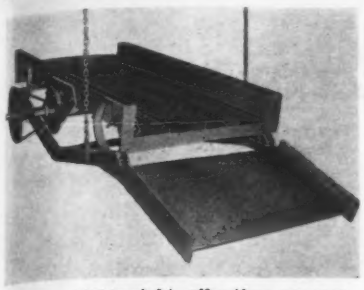


Kolman lightweight vibrating screens come in various models and sizes for attachment to any belt conveyor or bucket loader.

Conveyor-Mounted Vibrating Screens

A new line of lightweight vibrating screens adapted for screening and sizing gravel, crushed rock, and similar materials has been developed by the Kolman Mfg. Co., W. 12th St. Road, Sioux Falls, S. Dak. These screens are available in various models and sizes for attachment to any belt conveyor or bucket loader, and are driven from it by V-belts or chains.

The parabolic screen deck construction causes the material to spread over the complete width of the screen, utilizing the entire screening area, according to the company. Intensity of vibration may be controlled for various materials. The Type SB screens feature undermounted vibrating mechanisms and are specifically designed for lightweight construction, for mounting on a conveyor or loader. The clear deck of the screen enables easy handling of bulky material, Kolman says. The Type SB is available with 4½-foot x 24-inch, 5-foot x 32-inch, or 6-foot x 36-inch screen decks. Recommended operating speed is from 1,400 to 1,800 rpm.

The company also manufactures a Model SA and Model DA screen. Both of these are available with a screen deck size of 5 feet x 32 inches or 6 feet x 36 inches. The SA features an overmounted vibrating mechanism with 8-inch clearance. The DA is a double-deck unit designed for washing plants and other uses where more than one size of material is required. These two units have operating speeds of 1,400 to 1,700 rpm. The SB and SA require approximately one hp, the DA 1½ hp.

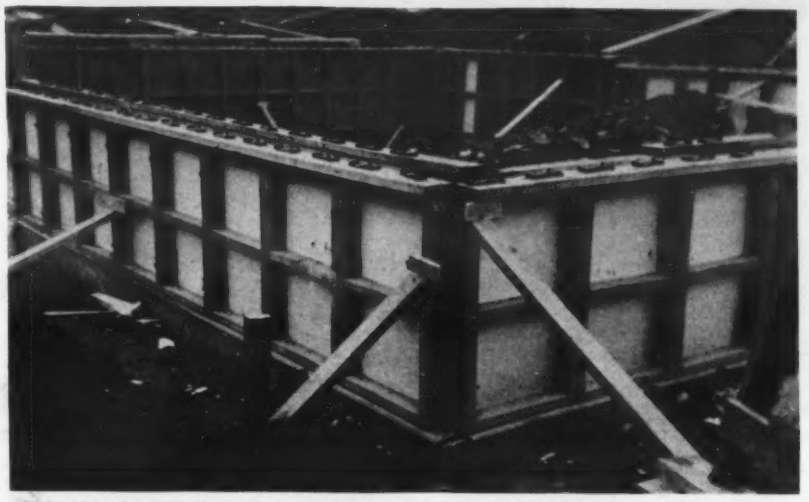
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 66.

New Concrete Forms Eliminate Bracing

A new system of concrete forms, designed to eliminate 2 x 4 wales and bracing lumber, has been developed by Consolidated Concrete Form Corp., P. O. Box 96, Teaneck, N. J. The company points out that erection and stripping of wales represents a large percentage of form labor cost. With the Kenney forms only one or two rows of liners are required for alignment purposes. Holes are furnished in both ends of the wall ties for attaching liner hooks; therefore liners can be put on at any location. The ends of all wall ties extend out one inch from the back face of the forms, which gives support to the wood liners.

These new units are available in both a 2 x 4 frame and a steel-frame plywood-faced concrete form. The plywood is plastic-coated for ease in stripping, for a smoother surface, and for longer use. Simple fasteners lock the panels together and secure a wall tie in one operation. All holes and slots are made with jigs and dies to assure fit. There are no rights or lefts, or ups or downs; they are all interchangeable. Alignment is secured by a 2 x 6-inch plate on top of the forms. Use of the 2 x 6 also prevents concrete from slopping over and falling on the form panels below.

Kenney forms are available in widths of 12, 16, and 24 inches, and lengths of 4, 6, 7, 8, 9, and 10 feet. According to the company, the form and tie will take a full head of 6 to 8 feet of concrete in an 8-inch wall. All-steel ties are furnished with the break-back features, and stainless-steel ties can be furnished to break off flush with the wall. The system permits the removal of any form panel, to set a forgotten box or sleeve, and also permits stripping to be done from any point. These forms, the company says, can be used for footings, walls, pilasters, columns, and slabs.



Note the absence of wood wales and the small amount of bracing in this photo of Kenney plastic coated forms used on a Connecticut housing project.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 49.

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PAVING BREAKER TOOLS

We manufacture a complete line of tools for pneumatic paving breakers, rock drills and diggers.

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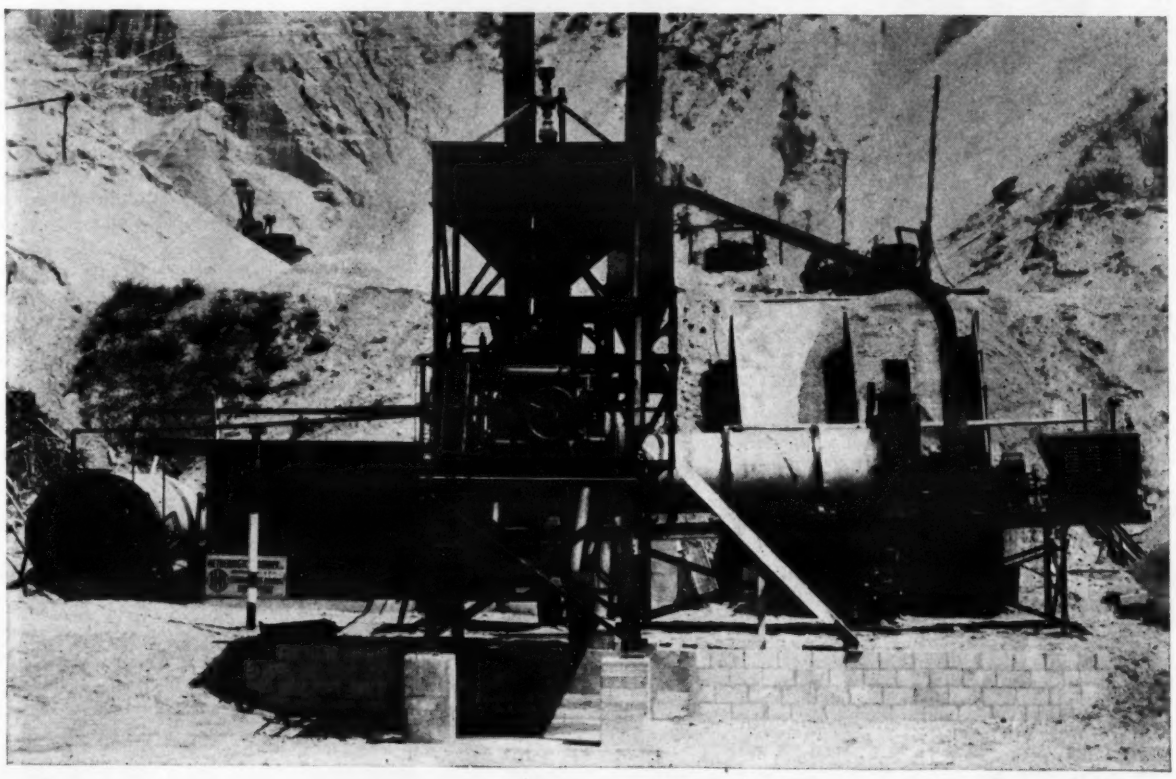

An Economical Bituminous Mixing Plant

–economical in first cost and in operation–especially adapted to maintenance work and small paving jobs

Pictured here is a Model CH-9 Hetherington & Berner bituminous mixing plant. This is a medium capacity (15 to 25 tons per hour) batch mix type plant which may be used for producing either hot or cold mix work. Simple and sturdy in design, CH-9 plants are economical in first cost and in operation, and are ideally adapted to maintenance work and small paving jobs.

CH-9 plants may be equipped with either gasoline or diesel engines, or they may be electrically operated. Aggregate feeder, dust collector for dryer, and screen are available as optional equipment.

Contractors and highway officials interested in producing the highest type of mixes with a minimum investment in plant and low operating costs will find it will pay them to investigate CH-9 plants.

See your local H & B distributor, or write direct for Bulletin MC-49.

THE HEAVY-DUTY *Moto-Paver*

The Moto-Paver does the complete mixing and laying job—in one continuous operation. This heavy-duty model is especially designed for heavy mixing, retread and stabilization jobs under the toughest of operating conditions. No other method or machine can produce comparable results at comparable cost. Write for Bulletin MP-49.

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Engineers and Manufacturer

731 Kentucky Avenue Indianapolis 7, Indiana

H & B builds portable and stationary asphalt plants of all types, sizes and capacities

1. A neat windrow of base material on the Hollywood Freeway is grooved to take a cement injection. A P&H truck crane swings cement buckets to a hopper on the shaper.

2. A Wood Roadmixer pulled by a D8 picks up the windrow and mixes into it about 11½ gallons of water per linear foot. It gets its water from the tank trailer behind.

Hollywood Expressway Paving in High Gear

Base Stabilized by Cement and Sealed; Concrete Laid at Rate of 4,000 Feet per Shift by Fast Contractor

✦ THE dull boom of dropping paver skips and the rumble of batch trucks are welcome noises along the Hollywood Freeway route in the City of Angels. For out of the noise and dust and confusion a broad ribbon of concrete is growing between Grand and Virgil Avenues. Linking the many disconnected grade crossings and other structures, the concrete ribbon is the first tangible evidence, to most residents of Los Angeles, that plans have long been made to relieve the traffic snarl.

N. M. Ball Sons of Berkeley, Calif., with two big paving contracts side by side, is setting a pace which other contractors admit will be difficult to equal. The first contract, from Grand to Glendale Boulevard, is 1.159 miles long and will cost $938,000. The second, from Glendale Boulevard to Virgil Avenue, is 1.55 miles long and will cost the California Division of Highways $1,287,000. By the end of the 1950 working season, paving will be complete and ready for use.

One of the structures this paving connects with the downtown Los Angeles area is the noted 4-level grade separation near Sunset and Figueroa Streets.

Paving, on the structure approaches especially, is a road builder's nightmare. At one bridge there are 14 lanes to feather in. At the 4-level structure and some of the satellite bridges, equipment had to move in a general circular pattern for weeks, following a series of paving strips that were planned with chesswork precision so the lanes could cure long enough to stand the weight of machinery. At several points the contract limits ended at vertical dirt banks, with no room to get paving equipment in and out. Hand work was necessary.

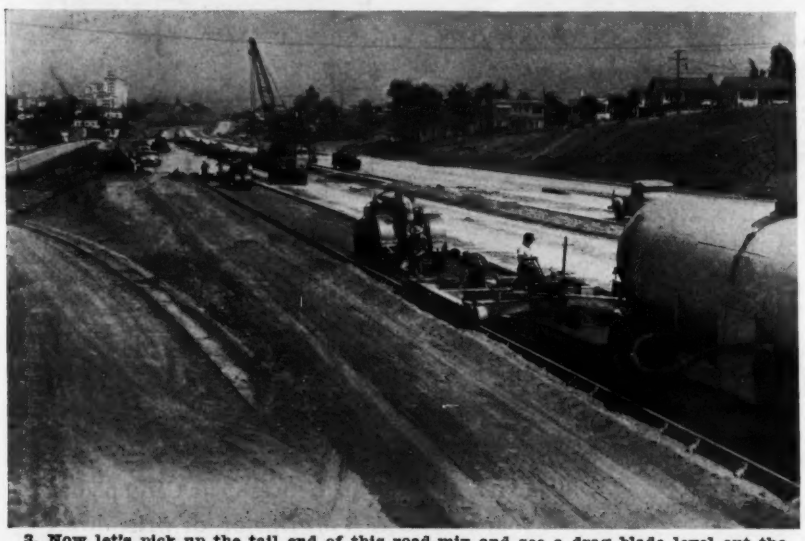
On the straightaways, however, Hollywood Freeway is an 8-lane divided highway, separated by a 15-foot dividing strip. Each roadway (inbound and outbound) consists of three 12-foot lanes and one 11-foot lane. The Freeway and most of the approaches are portland-cement concrete. Asphaltic-concrete paving is stipulated at some of the minor approaches and exits.

Variable lane widths, too, posed construction problems that only special equipment has been able to solve. In one case an 11-foot lane changes to 12 in 100 feet. In other cases there are 11, 12, and 13-foot variables. Much of the equipment, especially that on base stabilization, was therefore shop-built to be adjustable through these transitions.

Due to the numerous construction problems that would naturally arise in a project of this size and nature, frequent conferences were necessary to work out conditions and problems.

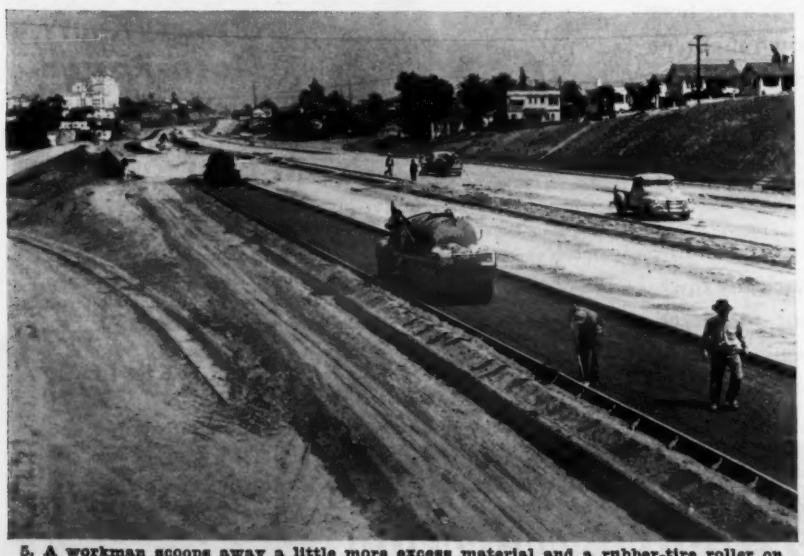
(Continued on next page)

C. & E. M. Photos

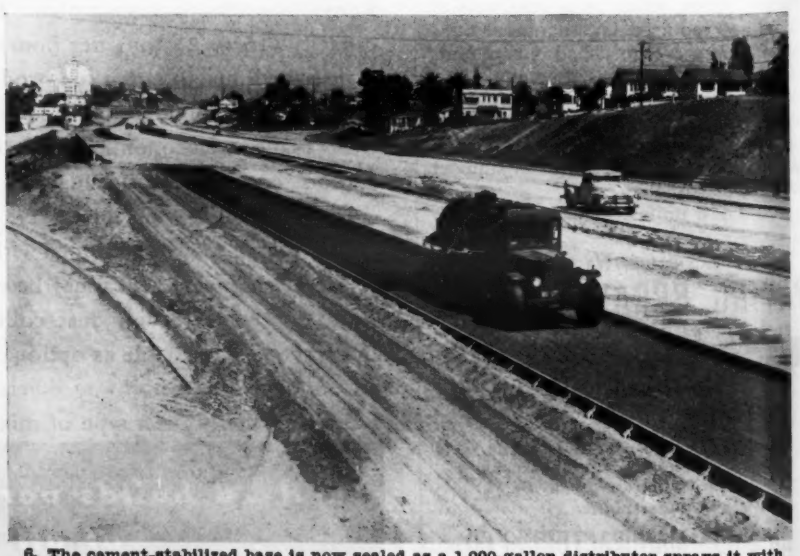


3. Now let's pick up the tail end of this road-mix and see a drag blade level out the mixed materials. At this stage mixing is complete.

4. Pulling a Standard-Lewis subgrader, this Huber roller cuts away excess material to make the grade accurate.



5. A workman scoops away a little more excess material and a rubber-tire roller on the back of a truck does final compaction. It has a water spray to supply moisture.



6. The cement-stabilized base is now sealed as a 1,000-gallon distributor sprays it with Stancal 60-70 mixing emulsion.

C. & E. M. Photo.
Ball Sons workmen install longitudinal keys in the B-K steel paving forms.

C. & E. M. Photo
Steel dowel bolts are screwed into nuts set in the previously poured concrete.

C. & E. M. Photo
Fresh concrete dumps out of a Koehring Twinbatch paver bucket in front of a line of machines that will spread and finish it.

Work has proceeded on the two projects on schedule under the direction of Stanley A. Ball, co-owner, who has acted as Project Manager, and his capable staff of experienced construction men which includes C. D. Orcutt, Superintendent; N. K. MacKenzie, Engineer; W. C. Wentworth, Concrete Foreman; J. V. Bostick, Soil Cement Foreman; J. P. Rogers, Headerboard Foreman; Walter Butler, Grading Foreman; D. G. Spencer, Office Manager; M. M. Meadows and F. F. Moore, Timekeepers; and George A. Best and Mike Morando, Master Mechanics.

Cement-Stabilized Base

The California Division of Highways specifies cement stabilization on the granular base of many of its current paving projects, and this was no exception. Plans called for from 3 to 5 per cent of portland cement in the upper 8 inches of granular base, distributed uniformly with moisture by a mixed-in-place treatment.

The first piece of equipment to pass a given point was a Caterpillar D8 tractor, with two machines trailing from its drawbar. The first machine was a drag blade on a Standard-Lewis subgrader, with a Case engine-driven conveyor to remove excess material. Variable widths are available on this machine by means of wide-flange wheels.

The second machine was a combination scarifier, ripper, blade scraper, windrow shaper, and cement-injection device. Variable width is accomplished on this machine by long worm-screws, fore and aft, and wheels operated by hand. The ripper teeth are carried on a heavy forward A-frame. Special shop-built blades behind the ripper teeth shape the loosened base material into a windrow. Cement is injected into the center of this windrow by a feeder device which operated from a driveshaft geared to the front wheels. This gives the operator the cement he needs. A 6,500-pound cement hopper, mounted on this machine, was charged when necessary by a P&H truck crane, which transferred loaded cement buckets from a flat-bed truck to the hopper. The buckets were filled from a downspout at the batch

(*Continued on next page*)

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More and more operators of excavating equipment are specifying the new AMSCO® Rever-SharP

The new Amsco Rever-SharP—designed for use with power shovels, draglines and rippers—is now available in a wide variety of sizes. Th… new tooth combines the … work-hardening properti… ganese steel with a … portant construc…
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1. Manganese Steel Construction throughout—The Rever-SharP actually thrives on hard use . . . *the harder you use it, the harder it gets!*

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3. Reinforced Cutting Edges—specially designed extended corners are the first to work-harden, thus equalizing wear along the entire length of the cutting edge.

4. Heavy, Rugged Adaptor—extra metal protects base connections and lips. Now available for all base connections.

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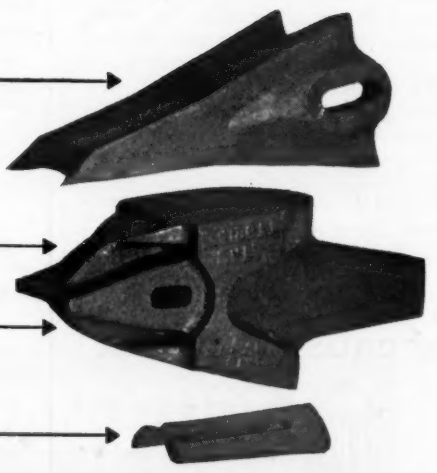
6. Tapered Lock-Key—easy to insert and remove. Has rubber insert—can't work loose in service.



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C. & E. M. Photo
Only 24 hours after the pavement is placed, the P&H truck crane gets busy pulling the form sections.

Hollywood Expressway Paving in High Gear

(*Continued from preceding page*)

plant, where the cement silo put out material for the pavement.

The initial pass by this first pair of machines and their D8 towing tractor changed the original granular base to an accurately shaped windrow, with the proper 3½ per cent cement content inside and covered.

The next group of machines, which mixed and laid the windrow, was also pulled by a D8. This group consisted of a Wood Roadmixer, a 5,400-gallon water-tank trailer, and a shop-built spreader drag.

The Wood Roadmixer was driven through a power takeoff by the D8 engine. Moving about 18 fpm, it picked up the windrow and mixed approximately 11½ gallons of water per linear foot into the material. Scarifier teeth behind the water-tank wheels loosened their marks, for the ponderous load of water, the Jaeger 4-inch Sure-Prime delivery pump, and the rest of the weight resulted in some compaction.

Mixed material discharged from the Wood Roadmixer was spread out in the same pass by a drag scraper which rode along in the equipment train. A cable from the water-tank frame pulled it along. This scraper also was adjusted by long worm-screws fore and aft.

The laydown and final compaction of stabilized base followed, then, as closely as possible. An Austin-Western 3-wheel roller made the first compaction passes, mostly to smooth the material. This roller was followed by a Huber 3-wheeler, which dragged a Standard-Lewis subgrader behind. A small amount of excess material was skimmed off and conveyed outside the forms. The longitudinal key was brushed clean by a steel-wire device carried behind the subgrader wheels.

The use of steel-wheel rollers to drag a subgrader is somewhat unusual in southern California. If the roller got stuck, as sometimes happened, a snatch pull from the Austin-Western 3-wheeler out in front always solved the problem.

After the steel-wheel machines had finished with compaction and dressing, a final compaction roll was made by a rubber-tire roller, consisting of five 7.50 x 20 tires. The Ford truck on which the roller was mounted also carried a 500-gallon water tank with gravity spraybars, and kept the stabilized surface from drying out while the machine was working.

The stabilized base was then sealed to retain the moisture. Stancal Asphalt & Bitumuls Co. of Los Angeles furnished the 60-70 Mixing Emulsion for the seal. On a 12-foot lane, Stancal's 1,000-gallon Rosco distributor applied approximately 23 gallons per station, at a temperature of 120 degrees F.

Keys Installed

Longitudinal keys were then installed on the Blaw-Knox steel paving forms. Each key form was 10 feet long. Each key had male and female slip-type

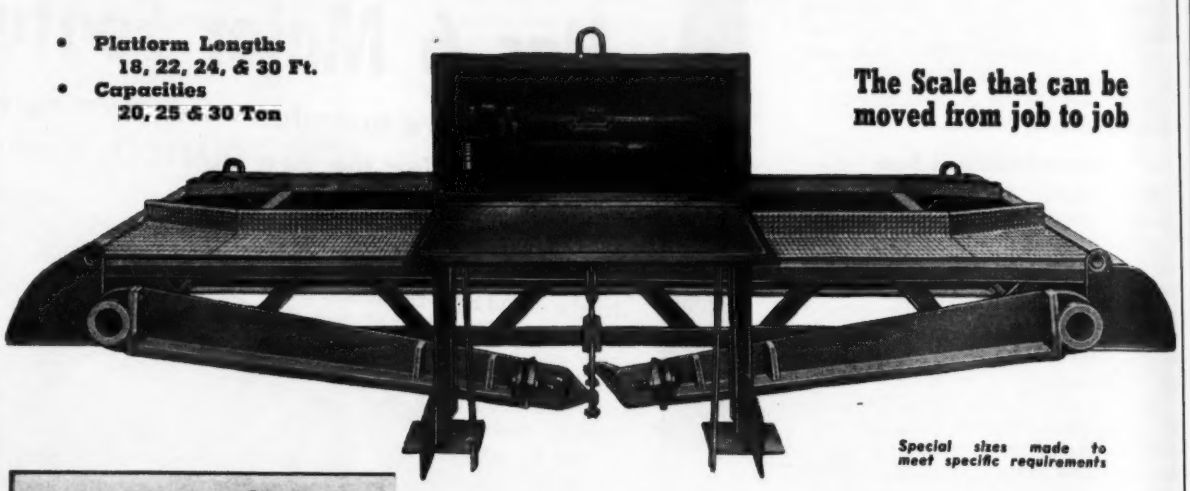
(*Concluded on next page*)

C. & E. M. Photo
Left to right, Superintendent C. D. Orcutt, Inspector R. E. C. DeLlaney, Concrete Foreman W. C. Wentworth, and Soil Cement Foreman J. V. Bostick.

THURMAN PORTABLE TRUCK SCALE

- **Platform Lengths 18, 22, 24, & 30 Ft.**
- **Capacities 20, 25 & 30 Ton**

The Scale that can be moved from job to job



Special sizes made to meet specific requirements

Above: Crane loading the truck scale.

Right: Loading with a winch

Accurate and Portable—This scale can be moved from job to job by removing 6 nuts which hold side arms in place. The rest of the scale can be lifted as a unit. Scale can then be moved and readied for use in minutes.

Wide Steel Bases—support scale—require no concrete footings. Easy-to-read baked enamel weighbeam with vital parts electroplated against corrosion.

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Wheelbarrow scales: Sturdee Model

1,000 pound capacity

Deck: 30"x42"

2 beam unit $245.00

3 beam unit $260.00

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Capacity 500 pounds

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Warehouse Type

Capacity	Deck
1,000 pounds	30"x42"
2,000 "	30"x42"
6,000 "	48"x72"

Other sizes to meet your specific requirements

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fasteners, and the countersunk holes in the steel permitted a cast-steel nut to be placed flush with the form. Steel dowels along the longitudinal joint consisted of a tie-bolt assembly. The first 15 inches of this assembly was held by the cast-steel nut, without chair supports, when the first lane was placed. The other 15-inch half was screwed into the other end of the nut after its body had been embedded in the concrete slab.

Small steel nuts passed through holes in the paving forms to catch the joining nut and hold it secure.

Paving in High Gear

The same paving crew which last year laid 6,700 feet of 12-foot pavement in an 8-hour shift has set the Hollywood Freeway afire with speed. There were so many structures to cross, so many equipment moves to make, that 4,000 feet per shift was the best record on this job up to the time it was visited.

The paver was a Koehring 34-E Twinbatch, with a 35-foot boom and a dual-gate bucket. It crawled over previously poured concrete on all lanes but the first. To prevent damage to the slab, worn rubber automobile tires were thrown under the track as the paver moved along. According to the paving superintendent this practice is faster and more economical than wood mats.

Mixing water came from city hydrants, and was transferred to the paver from a trailer tank. The mix for a 1½-yard batch consisted of 1,681 pounds of 3 to 1½-inch rock; 1,020 pounds of 2 to ⅜-inch rock; 457 pounds of ¾ to No. 8 aggregate; 1,937 pounds of sand; and 705 pounds of cement.

With the exception of a bit of fun when the machines passed under the overhead crossings, paving was largely routine. The 8-inch uniform unreinforced concrete was dropped across the 12-foot lane, or other widths where specified. In quick order came a Blaw-Knox spreader, a Blaw-Knox finisher, a joint-cutting bridge which cut and installed the contraction joints every 15 feet, long-handled hand floats for a preliminary dressing, and a Madsen-built Johnson float finisher which, as Concrete Foreman Wentworth said, "is the money-maker". When it had finished there was nothing left to do but drag a burlap finish on behind the machine, and apply a coat of Hunt Process Gray membrane cure.

A tamping screed on the Blaw-Knox machine drove any large aggregates down into the surface of the concrete, and the form edges were vibrated by two electric Viber machines which trailed the spreader. The finished pavement is dense, smooth, easy-riding.

Mechanical Form Pulling

According to Ball's construction economics, the mechanical removal of steel forms the day after the concrete was placed paid great dividends. A small P&H truck crane with a steel strip grip puller jerked the 10-foot sections loose, steel pins and all, at the astounding rate of 1,000 feet an hour. The only preparation for stripping consisted of the removal of the steel bolts which passed through the forms to the dowel nut.

Mechanical pulling of forms is notoriously destructive, but damage here was nullified by welding steel braces inside the outer webs on some 33,000 feet of forms. The extra bracing helped to resist warping when the crane applied its pull. Too, when the pull was applied, the crane boomed over, so the direction of force tended to pull the form away from the concrete rather than into it, or even straight up.

The forms were cleaned, the keys removed, and they were then moved out ahead by a low-bed trailer which was easy for the labor force to load. Forms were set to a string line in a trench excavated by a Cleveland Form-grader. The pins were driven by air guns from a Schramm portable compressor.

Batch Plant in Center

The batch plant was practically in the center of the two contracts. Consolidated Rock Products Co. supplied all concrete materials and Camillo Bros. furnished batch trucks as needed.

The batch plant was a portable Conveyco 120-ton setup, with its compartments divided to take 40 tons of sand, 40 tons of No. 1, 20 tons of No. 2, and 20 tons of No. 3. Two Northwest cranes with 1½-yard McCaffrey clams kept the compartments charged from stockpiles Consolidated trucked in. Bulk cement, hauled from the Colton Cement Co. at Colton, Calif., was stored and batched in a 1,000-barrel Conveyco silo.

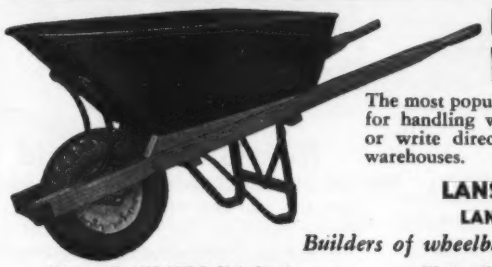
Dry batches, from 3 to 6 in a truck depending on its size and make, went out to the paver in a cloud of dust. Nearby housewives sometimes grumbled until they remembered that the dust was a sort of signal that the traffic problem was being met.

Personnel

Both contracts are under the general supervision of George T. McCoy, State Highway Engineer, with P. O. Harding as Assistant State Highway Engineer with headquarters in Los Angeles. Herb Belford is Resident Engineer on the west contract, while H. Ayanian supervises the work from Grand to Glendale.

Lundahl Fills New Position

John Lundahl is now Sales Representative-at-Large for the Detroit Diesel Engine Division of General Motors Corp. In this newly created position, he will be on special assignment, working with regularly assigned sales representatives throughout the country. He will also be available to assist in special engine installations.



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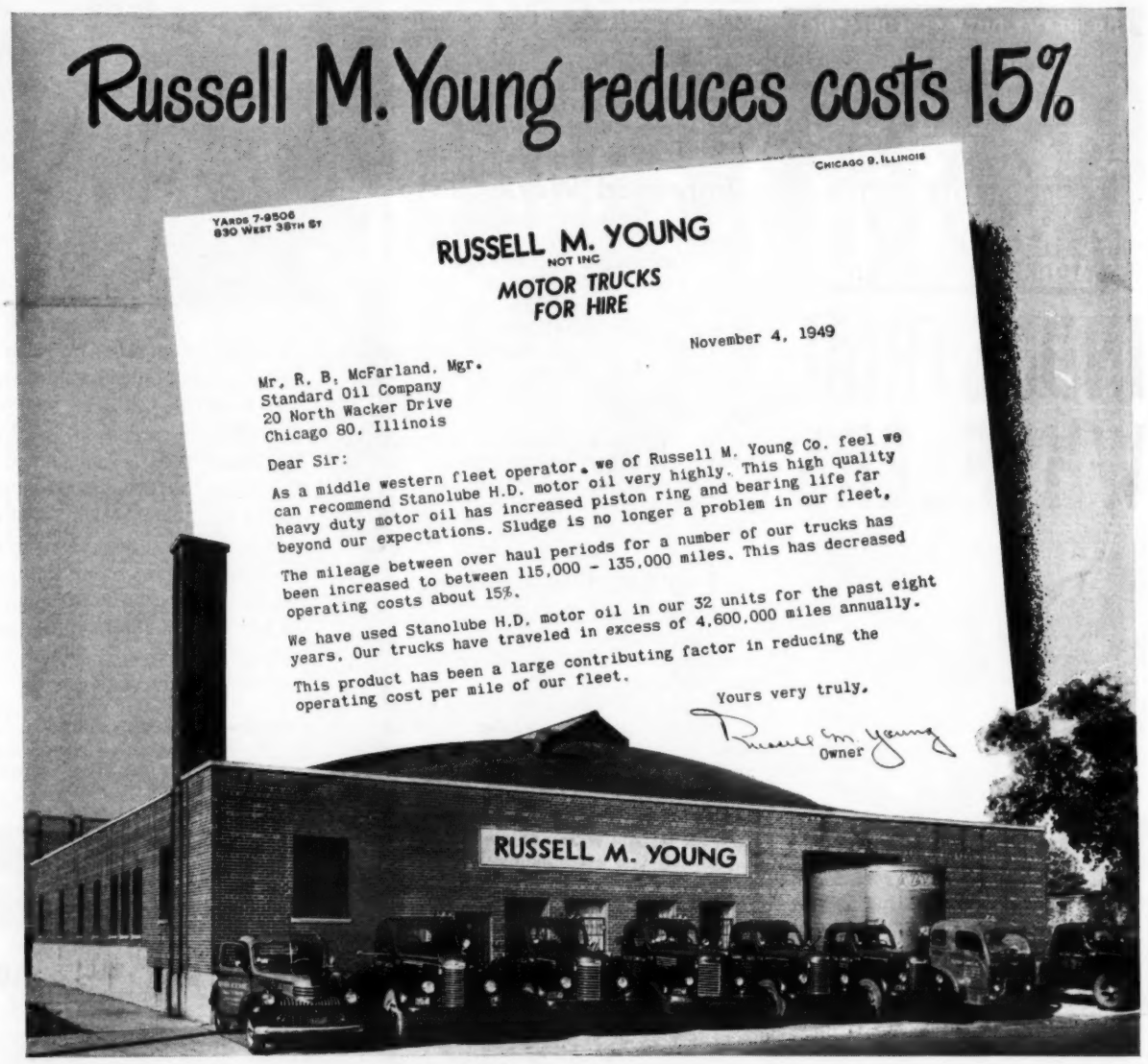
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We have used Stanolube H.D. motor oil in our 32 units for the past eight years. Our trucks have traveled in excess of 4,600,000 miles annually.
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Yours very truly,
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THE benefits reported by Mr. Young are typical of those obtained by operators of all types of automotive equipment — trucks, buses, tractors, taxis — when STANOLUBE HD has been used.

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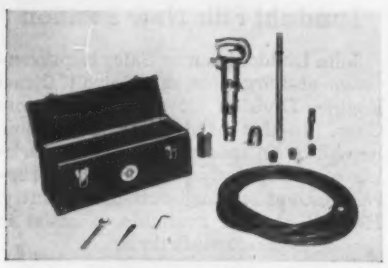


Gardner-Denver's S17 utility drill and carrying case.

Multi-Purpose Drill

A new lightweight utility drill for maintenance crews has been announced by Gardner-Denver Co., Quincy, Ill. It comes in a handy carrying case with a complete kit of drill accessories, including a 14-inch drill steel and three assorted-size rock bits, a star-drill adapter, and 25 feet of air hose.

The Gardner-Denver S17 is a self-rotating pneumatic hammer drill that weighs 19 pounds. According to company reports, it's a handy tool for placing anchor bolts, for running conduit or cable or pipe, and for many other jobs. It will drill concrete, brick, or stone with standard drill steel, and the star-drill adapter furnished with the drill accommodates standard star drills. A special stop-rotation feature converts the S17 to a lightweight chipping hammer or pick. The hand-formed D-shaped handle is convenient to hold, and the trigger throttle with partial feed position for easy hole starting contributes to the operator's safety.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 40.

New Starting Fluid

A fluid prepared especially to facilitate the starting of diesel and heavy-duty gasoline engines in subzero weather has been developed by Sta-Vis Oil Co., 202 Eagle St., St. Paul, Minn. "Just a few drops of this fluid will start the most stubborn engine in the coldest weather", the company claims. Sta-Vis starting fluid is packaged in 24-ounce sealed cans. It saves time, as well as wear and tear on engine and battery, Sta-Vis says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 105.

Improved Work Glove

A new all-purpose work glove with a wing-type Dura-Thumb is announced by the Richmond Glove Corp., Richmond, Ind. It is specifically designed for heavy material-handling where hand protection is required. It is available with a 4½-inch gauntlet or 2½-inch safety cuff.

Features of the new glove include an all-leather thumb, a continuous seam on the back of the thumb, a seamless palm, and a water-resistant cuff.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 93.

Jaw and Roll Crushers

Two new bulletins, one on jaw crushers, the other on roll crushers, have been prepared by Diamond Iron Works, Inc., Minneapolis 11, Minn.

The first tells what you need to know to select a primary crusher. It discuses operating capacity, jaw adjustment, and care and lubrication. It gives capacity tables in tons per hour for various crusher sizes and stone sizes desired. It lists complete specifications for eleven crusher models ranging in size from 6 x 12 to 36 x 48. It includes general dimensions, illustrations, and descriptions of the important features of the units.

The second folder gives similar information on the Diamond roller-bearing roll crushers. These range in size from 16 x 16 to 54 x 24 rolls.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 17.

Dewatering Operations

"Dewatering by predrainage gives you dry digging in wet soils and offers a basis for a simple, positive, and practical method of combating water hazard on construction operations," according to a new booklet prepared by Complete Machinery & Equipment Co., Inc., 36-40 11th St., Long Island City, N. Y. The booklet points out that the fluted-tube design of the Complete wellpoint offers an 8-inch drainage surface on a 2-inch-diameter wellpoint.

The literature outlines the free engineering assistance and on-the-job field service of the Complete organization. It describes the components of the wellpoint system: jetting nozzle, riser pipe, swing joint, header, and the wellpoint pump. A dozen on-the-job photos illustrate the use of Complete wellpoints under varied conditions. A number of pages are devoted to installation and operation suggestions and include engineering drawings of proper positioning of the units.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 5.

Richkraft Executives

The Richkraft Co., Chicago manufacturer of building papers and reflective insulation, has appointed Lester R. Wroble Vice President and Herman L. Smith Eastern Sales Manager. Mr. Wroble will headquarter at Chicago and Mr. Smith at Cleveland.

FOR HEAVY-DUTY PERFORMANCE AND UTILITY
the Preference is . . .
MINNEAPOLIS-MOLINE
MM
MODERN MACHINERY

INDUSTRIAL WHEELERS

Model UTI clearing snow on a construction project helps to maintain contractor's work schedule.

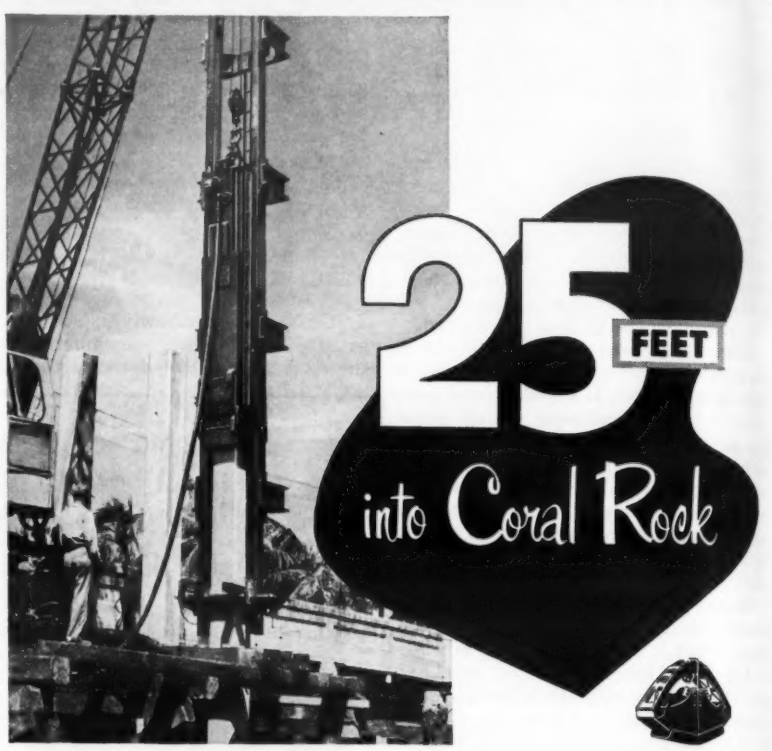
High lift and 2½ yd. controlled bucket for efficient piling or truck loading.

MM Industrial Wheelers are designed to handle a wide variety of jobs with a minimum investment in special equipment. They are of rigid heavy-duty design from radiator to drawbar with a 10,000 lb. capacity on the front end for heavy duty front-end loaders.

Attachments for a wide range of material handling and maintenance jobs include a choice of hydraulic or mechanically operated front-end loaders, dozer and snow plow blades, pull-behind and side-mounted mowers, rotary broom, pull-behind scrapers, single drum winch, and an all-weather enclosed cab.

For complete facts on 27 h.p. RTI or 49 h.p. UTI or UTIL models, see your MM dealer or write—

MINNEAPOLIS-MOLINE
MINNEAPOLIS 1, MINNESOTA



To drive 35-foot piles, 16 inches square, 25 feet into coral rock called for a highly dependable hammer. That is why Powell Bros., the contractors on this Florida State Highway project at Fort Lauderdale, used a McKiernan-Terry S-5 Single-Acting Pile Hammer. •This McKiernan-Terry Single-Acting Hammer strikes with a 16,250 foot-pound blow. It is of a highly specialized design for handling heavy mass piles such as concrete, and for driving into dense, difficult soils. • 17 sizes of hammers and extractors are available in the complete McKiernan-Terry line. Write for bulletin giving all the facts.

GRAB BUCKETS

COAL TOWERS

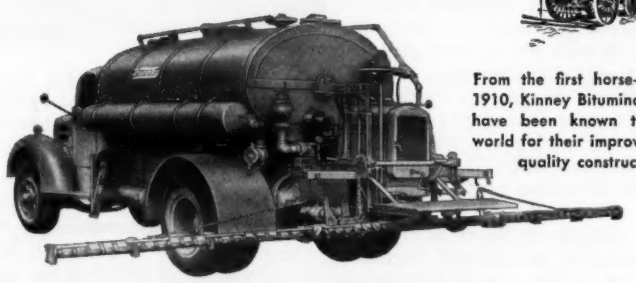
TRANSFER BRIDGES

McKIERNAN TERRY

McKIERNAN-TERRY CORPORATION, MANUFACTURING ENGINEERS
19 PARK ROW, NEW YORK 7, N. Y.
Plants: Harrison, N. J., Dover, N. J.
MK 280

KINNEY BITUMINOUS DISTRIBUTORS

FOR OVER 40 YEARS



From the first horse-drawn unit of 1910, Kinney Bituminous Distributors have been known throughout the world for their improved design and quality construction.

PUMP: Only Kinney has the famous SD rotating plunger pump that's accurate as a meter and always dependable.

HEATING SYSTEM: Two-burner unit placed low in tank heats safely, uniformly.

CONTROLS: Simple, three-way control valve—right at operator's fingertips—saves bitumen, speeds application.

PUMP ENGINE: Rugged Hercules engine, complete with transmission and compressor, has ample power for any job.

SPRAY EQUIPMENT: Handles tar, asphalt, cutback, and emulsions without adjustment. Available with Fraco circulating hot spray bar when desired.

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NEW YORK • CHICAGO • CLEVELAND • PHILADELPHIA • LOS ANGELES • SAN FRANCISCO
Write today for complete information.

Corps Speeds Concreting On Hydroelectric Turbines

Revises Method to Embed Turbine Scrollcase in One Pour On Wolf Creek and Center Hill Projects

✦ METHODS of pouring concrete around hydroelectric generator turbines were revised recently at the Center Hill Project and were pronounced highly successful and cost-cutting. They have been used on two of the units and will soon be used to speed installation of the third and last unit.

The revised procedure will step up completion of the three Center Hill 45,000-kw generating units and the six 45,000-kw units at the Wolf Creek Project by approximately one month each, and will produce an additional 102,000,000 kilowatt hours of electrical energy during the contemplated power shortage of the next two years.

Both Center Hill and Wolf Creek are multiple-purpose projects of the Corps of Engineers. Center Hill Dam in north-central Tennessee (see C. & E. M., January, 1948, pg. 44) will check floodwaters on the Caney Fork and Cumberland Rivers, and ultimately on the Ohio and Mississippi. Wolf Creek Dam in southern Kentucky (see C. & E. M., February, 1948, pg. 2) will check floods on the Cumberland.

One Pour Embeds Scrollcase

The new concreting method consists of embedding in one concrete pour the entire 15-ton scrollcase for each hydroelectric turbine. This pour, which is about 24 feet deep and contains approximately 1,400 cubic yards of concrete, is usually made in ten shallow pours with 3 to 4-day intervals between each.

The new method makes it possible to fill the entire scrollcase-penstock unit with water from the reservoir and under full reservoir pressure. This prestresses the scrollcase, and at the same time the cool water contracts the metal and shrinks the case to operating temperature, thereby making all corrections for elastic deformation.

The method provides a complete check on watertightness, and recaulking can be done under pressure until the case is perfectly watertight. This in itself is a desirable feature, especially with a butt-strapped joint-type of scrollcase construction which is difficult to check for watertightness by commonly used "in the dry" methods.

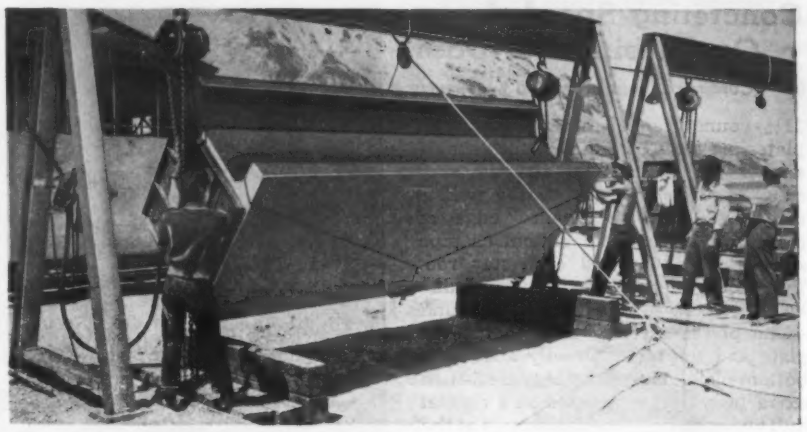
The weight of the water in the scrollcase opposes the hydrostatic uplift pressure of the concrete and permits continuous placement without fear of floating the case and causing misalignment. Instead of the former method of embedding the scrollcase with shallow lifts, with a waiting period between each lift to permit sufficient heat dissipation and shrinkage, the continuous concreting operation completes the job in one day. Allowing for the time to install the bulkhead device and other incidental work, the case can be completely embedded in one week. Under the original plan at Center Hill, the 10 shallow lifts at the rate of two per week would have taken five weeks. Provisions are made for the water within the scrollcase to circulate, and the cool water provides the medium for dissipating the heat of hydration of the concrete.

Another feature is that the circulating water tends to keep the case in uniform alignment during the concreting operation, by preventing to a considerable degree the distortion that would otherwise be caused by the changes in ambient temperature.

Bulkhead

The device used to bulkhead the water consists essentially of two 1¼-inch steel plates, one attached to the upper bolt circle of the speed ring and one attached to the lower bolt circle. The plates are connected by 2¼-inch-diameter stay rods on approximately 2½-foot centers. The stay rods extend through stiffeners mounted on the outside of each plate, and consist of 8-inch

(*Concluded on next page*)

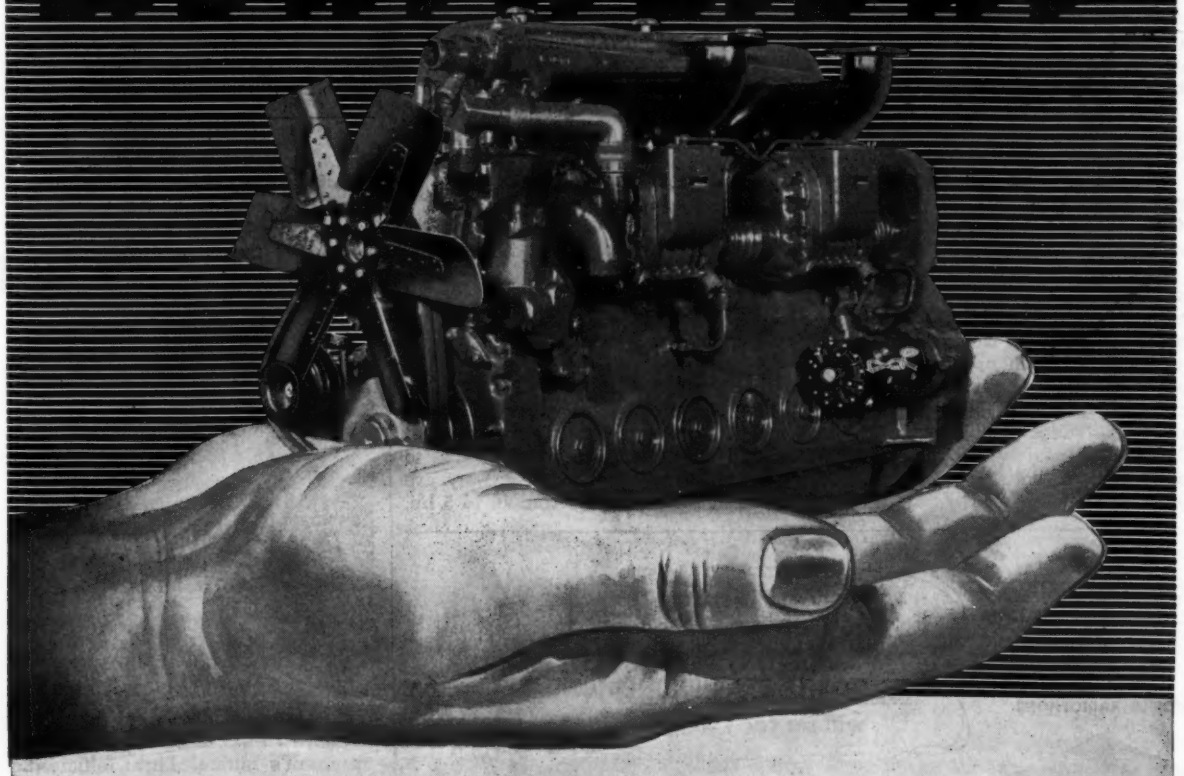


TWO MEN EASILY ROTATE SEVEN-TON TROUGH WITH VACUUM LIFTER

1400 troughs were made on a three-hour schedule with all forms removed. Vacuum lifter handles any load safely, quickly, economically. Write for information.

Vacuum Concrete, Inc. 4210 Sansom Street, Philadelphia 4, Pa.

LIGHTWEIGHT



P&H DIESEL ENGINES

(2 CYCLE)

Now, for the first time, a line of diesel engines in which *all* major castings are of lightweight alloys. This is what you have waited for . . . *less weight per horsepower,* rugged design for the toughest jobs . . . proved performance. And longer life, too! Write for literature. Diesel Division, Harnischfeger Corp., Port Washington, Wis.

P&H DIESEL DIVISION
HARNISCHFEGER CORPORATION
PORT WASHINGTON WISCONSIN, U. S. A.

Concreting Speeded On Turbines for Dam

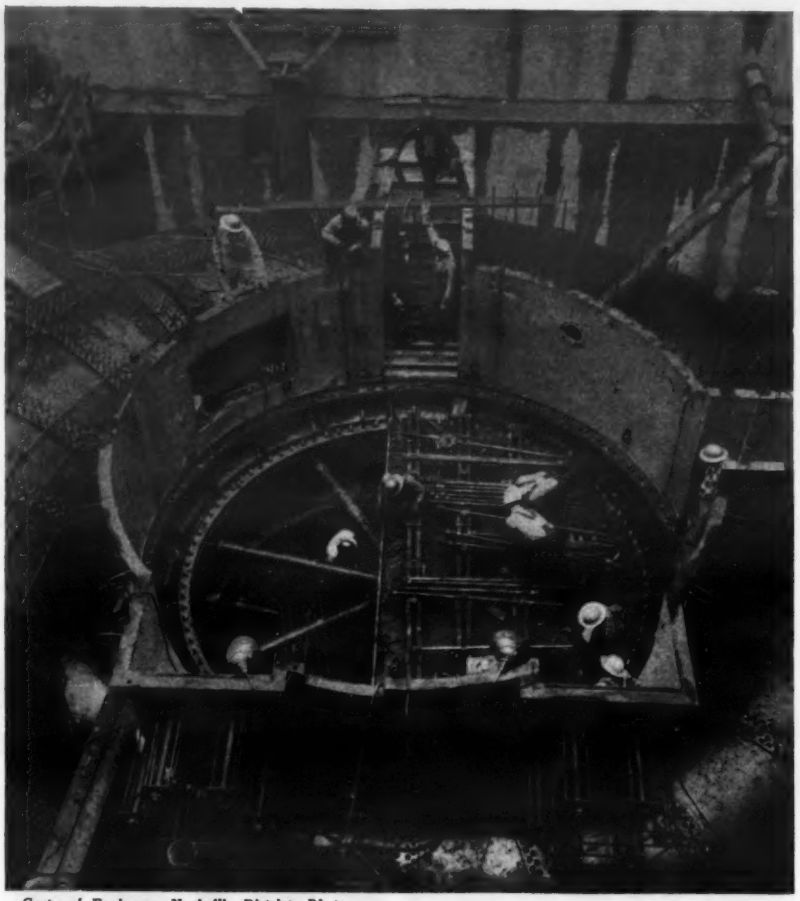
(*Continued from preceding page*)

11½-pound channels back to back. The plates are sealed against ⅛-inch sheet-rubber gasket material and the stay rods are sealed with rubber ring gaskets compressed into a beveled edge of plates welded top and bottom on pipe sleeves placed around each stay rod. Two 8-legged spiders within the bulkhead hold the speed ring in true round—one placed directly beneath the top plate and the other directly above the bottom plate. The spider legs are 6-inch extra-heavy pipe mounted on a central hub and with built-in jack screws at the outer ends.

A 6-inch pipe, properly gasketed, forms a hole entirely through the center of the bulkhead for the piano-wire center line from which measurements may be taken for alignment checks during concrete placement. The evenly spaced slots are cut in the outer edge of the top plate to permit a micrometer rod to rest on the machined surface of the upper bolt circle of the speed ring in order that level checks can be made. Circulation of water throughout the scrollcase is obtained by opening a 6-inch valve mounted in the lower plate and discharging into the draft tube. The bulkhead was designed for the reservoir level at spillway crest corresponding to a static head of 165 feet and is applicable both to the Center Hill and Wolf Creek power plants.

The bulkhead is supported to carry the weight of the confined water with four bents formed by 8-inch channels and welded by clip angles to the bottom of the draft-tube liner. The weight of water confined in the scrollcase is supported by 10 concrete saddles spaced midway between the pipe jack supports furnished by the turbine manufacturer for the support of the case itself.

One of the noteworthy features is that the bulkhead is constructed entirely of commercially available structural shapes and is completely devoid of any machine work other than that of drilling bolt holes. The weight is approximately 25 tons. In order to facilitate transportation, a split was provided sufficiently off center to clear the spider hubs. The edges of the plates at the split are flanged and connect with closely spaced bolts which draw up against sheet-rubber gasket material.



Corps of Engineers, Nashville District, Photo
A view of the scrollcase and installation of bulkheads showing the bottom bulkhead and spiders in place and the top bulkhead going in.

Designer, Contractor

H. B. Elder, veteran engineer for the Corps of Engineers and now Resident Engineer at the Center Hill Project, conceived this new method. Massman-Metcalf and Hamilton Construction Cos. are constructing the powerhouse at this project. Baldwin Locomotive Works is fabricating and erecting the penstock extensions, scrollcases, and turbines.

Self-Priming Centrifugals

Complete information on a line of self-priming centrifugal pumps is available from Goulds Pumps, Inc., Seneca Falls, N. Y. The pumps are of a new design that eliminates valves and yet is said to give efficiency comparable to standard centrifugal pumps. They are made in sizes ranging from ¼ to 5 hp, with both open and closed impellers, and they are designed for suction lifts up to 25 feet, capacities up to 120 gpm, and heads up to 135 feet.

The 8-page folder offers a general description and a list of applications and features of the various pumps offered. Principles of operation, specifications, and complete performance rating tables are given for all sizes.

This literature may be obtained from the company by requesting Bulletin 636.1, or by using the Request Card at page 16. Circle No. 82.

Catalog on Steel Derricks

A complete line of steel derricks, with capacities ranging from 2½ to 250 tons, is shown in a new 36-page catalog, No. 200-D-3, prepared by American Hoist & Derrick Co., St. Paul 1, Minn. The six different types of derricks are treated separately in sections which include complete specifications, outline drawings, and full-page operating pictures. Following these sections are complete construction details from boom point to sill connections.

To assist users, one page is devoted to the recommended method of determining boom length for lifting a required load to a predetermined height at a given radius. Briefly covered are lifting beams, swiveling fairleaders, blocks and sheaves, as well as revolver cranes and hoists.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 32.

Mendenhall at Steelcraft

Alan R. Mendenhall, formerly with the Geo. L. Mesker Co. of Evansville, Ind., is now Sales Manager of the Steel Building Division of Steelcraft Mfg. Co., Rossmoyne, Ohio.

IN PLAIN LANGUAGE
...here's what the NEW
RAYTHEON
FM MOBILE RADIOPHONE
will do for YOU...

MODEL UM 30
MOBILE RADIOPHONE

NO INSTALLATION PROBLEMS. Control unit mounts handy to driver in any type vehicle. Separate transmitter-receiver unit installs under dash, overhead, under seat, in trunk, anywhere.

HONESTLY RATED. Nominal values of output power 20 to 30 watts over the entire frequency band. Normal operation well within rated capacity means less frequent tube replacement, lower maintenance cost.

NO INTERFERENCE. Guaranteed to meet all FCC requirements including adjacent channel operation and modulation limiting.

LOWEST COST. You can't beat Raytheon Radiophone for economy of initial cost, operation and maintenance.

FOR ALL MOBILE EQUIPMENT. Available for 6, 12, 24 or 32-volt DC operation.

EVERY DESIRABLE FEATURE. Plug in mike either side of control case. Auxiliary volume control for noisy conditions. "Stand by" receiver operation saves 3 amps continuous battery drain. Furnished complete with all accessories. Single or dual channel models covering the entire 152-174 mc. frequency range.

50-60 and 20-30-watt base station equipment also available in console, cabinet or wall mountings. Write for complete information. Address Dept. 6460CE.

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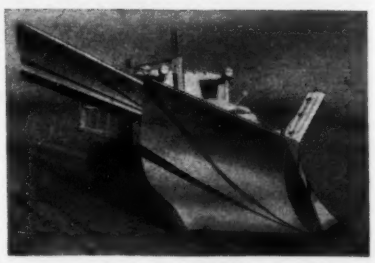
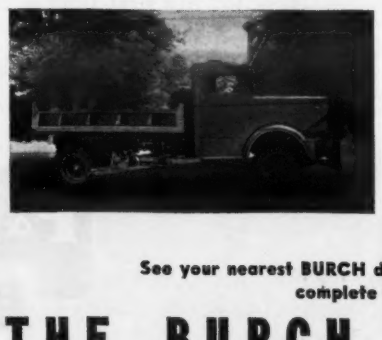
Sold Exclusively in Canada by Canadian Marconi Co., Marconi Bldg., St. Sacrament St., Montreal
Export Sales and Service: Raytheon International, 50 Broadway, New York 4, N. Y.

Order now and be sure!
BURCH EQUIPMENT



Illustrated is one of the many plow and wing combinations designed to hitch onto all trucks and tractors. The "SNO-FLOW" moldboard design provides for speedy, efficient snow removal. It's the result of years of experience in building "ROSS" snowplows.

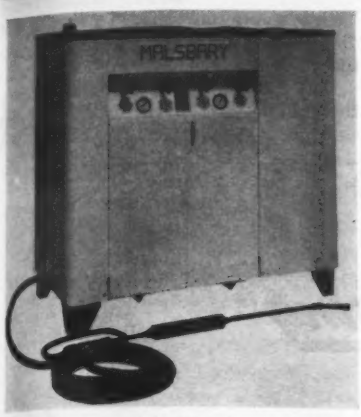
This sander attaches to any standard truck—ready to go at a moment's notice. Light, efficient, and inexpensive. Spreads material over 21' width at 10 M.P.H. Flow of material can be controlled.



The BURCH "Tilt-lev" under-truck blade offers an all purpose maintainer especially suitable for ice removal. The high degree of operator control (all hydraulic) makes it excellent for general road and ditch maintenance. Fits any standard, heavy duty truck.

See your nearest BURCH dealer, or write the factory for complete specifications

THE BURCH CORPORATION
SINCE 1875 CRESTLINE, OHIO



Malsbary's Model 250 steam cleaner uses a high-pressure pump to eliminate reliance on steam for force. Operating pressures go up to 250 pounds.

New Steam Cleaner Uses Pump Pressures

A new steam cleaner with practical operating pressures going as high as 250 pounds has been announced by Malsbary Mfg. Co., 845 92nd Ave., Oakland, Calif. It uses a high-pressure pump to eliminate reliance on the steam for force.

The Malsbary Model 250 features an automatic thermostat, safety valve, swivel-type gun, compact control and instrument panel, and a steam valve for solution stirring. It provides five distinct cleaning actions: steam cleaning (200 gph at 150 to 200-pound pressure), high-pressure hot or cold water (300 gph at 250-pound pressure), low-pressure wet steam, and low-pressure warm water. These medium-sized units may be used for cleaning vehicles, machines, construction equipment, and buildings.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 72.

New Safety Signal For Trailing Beams

A new safety signal designed to clasp firmly to steel beams, utility poles, pipes, etc., projecting from trailers has been developed by Roto Signal, Inc., Brecksville, Ohio. Like the highway warning signs developed by the company, the Roto Signal Model P rotates. It can be adjusted to fit any size of projection and has a pressure clamp that features a 900-pound grip.

Fiberglas is used in the sign. This material is said to be lighter than aluminum yet stronger than steel and is impervious to salt spray, acids, and oils. The signals also feature a new impregnated color and are scientifically reflectorized with Scotchlite. The company points out that the continual motion of the signal offers maximum attraction.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 62.

Portable Water Applicator

A circular describing a 2-wheel cart-type water applicator is offered by Rosco Mfg. Co., 3138 Snelling Ave., Minneapolis 6, Minn. The unit is designed for road spraying and dust settling, high-pressure power pumping, transfer of water or light liquids, fire fighting, soil-cement and soil stabilization of roadways and airports, treatment of surface construction to be compacted, etc. The applicator includes a power pumping unit, frame mounting, running gear, spraybar, and accessories. Complete specifications are given in the circular.

The Rosco water applicator is designed to deliver 350 gpm, but this output may be increased when the machine is operated at a higher governor speed. It can be equipped with a tachometer for use with haul tanks, to apply accurately measured quantities of water for soil cement and other types of surface construction where it is desirable to bring the soil up to optimum moisture content.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 14.

Foreign Engineers Study U. S. Highways

On September 1, fifty-five highway officials and engineers from 18 countries completed a course in the theory and practice of highway improvement and utilization conducted by the Bureau of Public Roads of the U. S. Department of Commerce.

The first two weeks of the course were spent on introductory material. The group then took a 3-week bus trip to study and observe highway construction and maintenance in the field. Five more weeks were spent in Washington on specialized studies. Then the visitors were assigned to selected states for detailed studies of highway administration, research, planning, construction, and maintenance. The course was concluded with a review and a discussion of activities.

Countries participating were: Turkey, the Philippines, Venezuela, France, Brazil, Ecuador, Peru, Denmark, Greece, Great Britain, Belgium, Nigeria, Israel, Sweden, Norway, Netherlands, Australia, and Finland.

Perlite-Plant Sales, Export

Muehleisen Perlite Process, Inc., Fort Worth, Texas, has established an office in Akron, Ohio, to handle the sales of its Perlite-processing plants in the United States and Canada. W. M. Lonas heads the new office.

A. G. Ensenat, 1001 Hibernia Bldg., New Orleans, La., is now Export Agent for Muehleisen.

WIN THE BATTLES OF THE SNOW
through
FASTER•SAFER•CLEANER
SNOW REMOVAL
with
DAVENPORT-FRINK
SNO-PLOWS

V-Blade Sno-Plows for all sizes and makes of motor trucks—also tractors, motor patrols and locomotives.

Straight Blade or Reversible Blade Sno-Plows are desirable for lighter snows or for cleaning one side of street or highway at a time.

DAVENPORT BESLER CORPORATION
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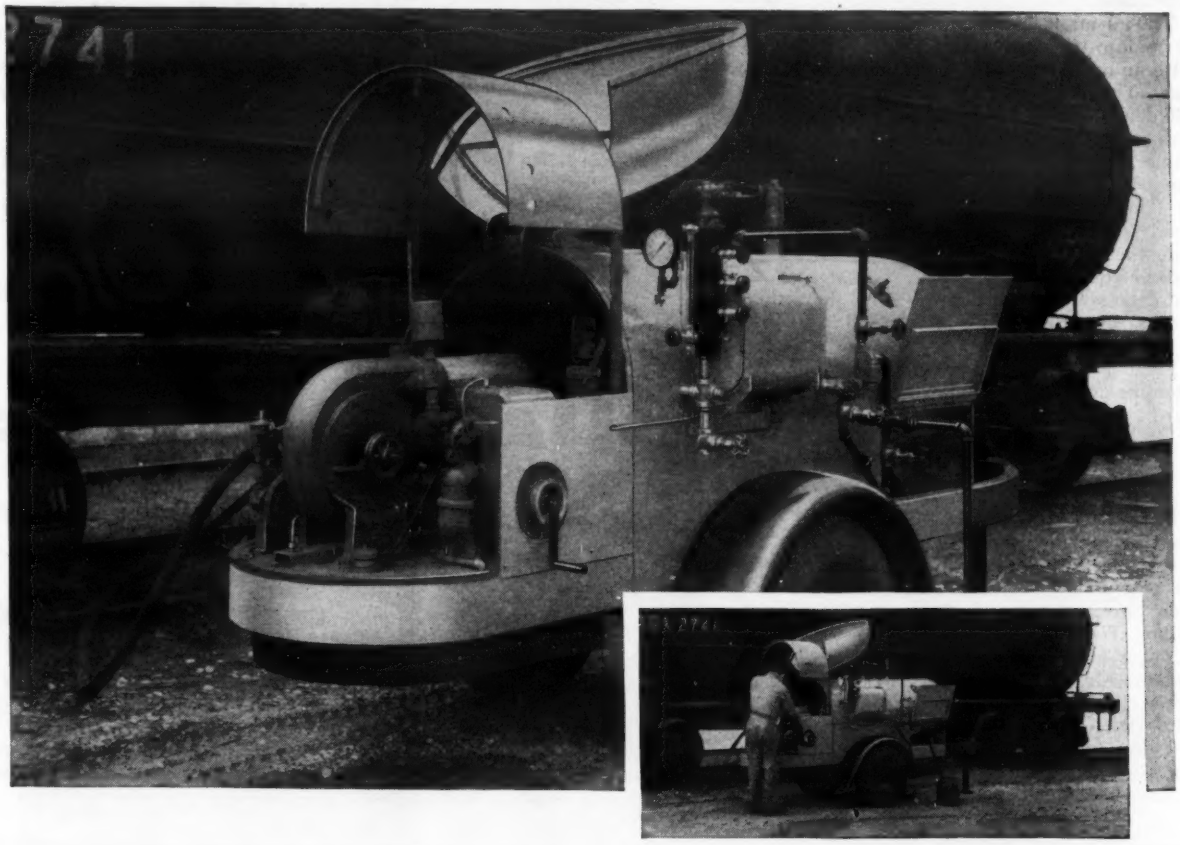
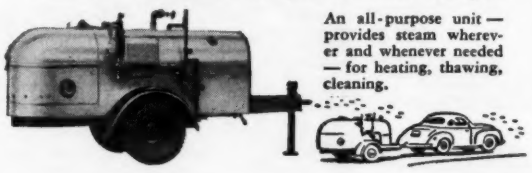
Made in Eastern U.S.A. by CARL H. FRINK, 1000 Islands, CLAYTON, NEW YORK



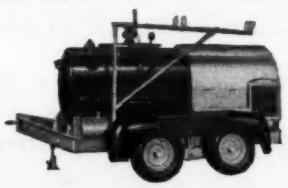
FAST STEAMING—FOR FAST TANK-CAR HEATING

Trailer or Truck Mounted for Quick Job-to-Job Transport



An all-purpose unit — provides steam wherever and whenever needed — for heating, thawing, cleaning.

Working Mate to the Tank-Car Heater — The Pumping Booster



Heat only what you need — not necessary to heat contents of tank car — with a Cleaver-Brooks Pumping Booster. No steam or water required for operation with this oil-fired, high efficiency unit. Available in 2 sizes, skid or trailer mounted.

Write on your business letterhead for the Bituminous-Mix Calculator — a ready reference slide rule showing weight of mix needed in lbs. and tons based on area and depth of area to be covered.

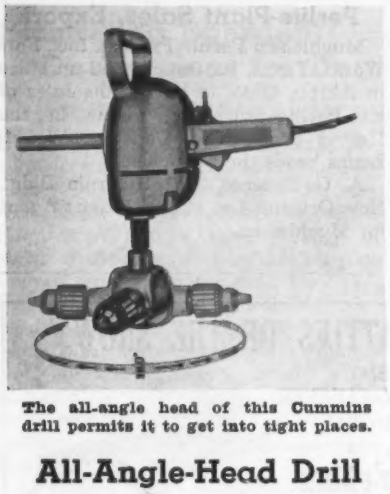
... Use Less Fuel—Water—Work With a CLEAVER-BROOKS Mobile Tank-Car Heater

Designed for fast steaming, the Cleaver-Brooks gives you 125 lbs. steam pressure in 20 minutes — the only tank-car heater with the fuel-saving four-pass flue travel construction. No water problem — full condensate recovery and return to heater under pressure.

Built for full capacity—full time work—available in three sizes, skid or trailer mounted 1 car heater (17 bhp) — 2 car heater (28 bhp), 3 car heater (42 bhp). Write for the Cleaver-Brooks Tank-Car Heater Catalog.

CLEAVER-BROOKS COMPANY
390 E. Keefe Avenue, Milwaukee 12, Wisconsin

Cleaver-Brooks
BUILDERS OF EQUIPMENT FOR THE GENERATION AND UTILIZATION OF HEAT



The all-angle head of this Cummins drill permits it to get into tight places.

All-Angle-Head Drill

A new 2-speed all-angle-head drill has been developed by Cummins Portable Tools, 4740 Ravenswood Ave., Chicago 40, Ill. With a low speed of 275 rpm for deep boring and high speed of 1,100 rpm for small holes and drilling lumber, the tool has a wide range of usefulness.

The all-angle-head feature enables it to get into tight spots often inaccessible with an ordinary drill, Cummins points out. The head rotates through a full 360 degrees. Joists set on 12-inch centers can be drilled with ease at any angle, the company says. Capacities of the drill range from ½ inch in steel up to 4 inches in soft woods. The angle head is removable from the spindle; and when the Jacobs chuck is then removed from the angle head and screwed onto the spindle shaft of the drill, the tool is converted into a standard-duty ½-inch drill.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 41.

B-G Personnel Changes

The Barber-Greene Co., Aurora, Ill., has announced new assignments for six members of its sales force. Earl D. Stearns, formerly General Sales Manager, now manages the Conveyor Division. Walter B. Holder, former Sales Manager of the Construction Division, replaces Mr. Stearns as General Sales Manager.

Ed Holt, Manager of Sales Area II, with headquarters in Washington, D. C., has been appointed Manager of the Eastern Division, and Lowell Larson, Manager of Sales Area IV at Minneapolis, now heads the Western Division. Ralph H. Dano, Manager of Barber-Greene's Canadian sales area in Toronto, has been assigned to Washington to replace Holt, and Marshall C. Ham, presently Merchandise Sales Manager, will take over from Larson.

Silicone Improves Liquid Snowplow Wax

Silicone added to Snow-Rem, a liquid snowplow wax, provides a smoother surface than was previously possible with this wax, announces Speco, Inc., 7308 Associate Ave., Cleveland 9, Ohio. It also increases the lasting qualities of each wax application. According to the manufacturer, Snow-Rem inhibits rust and may increase plowing speed as much as 25 per cent.

The wax can be applied with an ordinary paint brush or spray gun. Temperature at application should be above freezing and the plow surface should be dry. Speco recommends that users apply the first coat of wax in the fall before plows are put in service. Snow-Rem is available in 1-gallon open-top cans, 5-gallon pails, and 55-gallon drums.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 30.

A Quiz on Diesel Engines

A pamphlet of "inside" information on diesel engines used in GMC trucks is offered to truck operators by the Truck and Coach Division of General Motors Corp., Pontiac, Mich.

The pamphlet, written in quiz form, asks such questions as "What is 2-cycle?" "Are diesels hard to start?" "What is the fuel-injection pressure?" "Why use a governor?" "Is the GM diesel supercharged?", and then gives the correct answer.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 111.

MC Self-Raising Tower-Hoist

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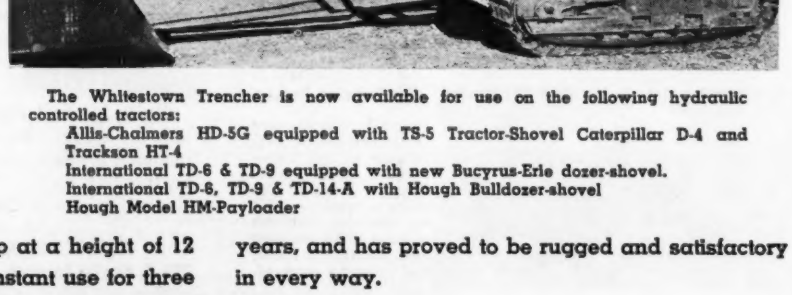

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For further information and literature on products described in this issue, turn to page 16 for the Red Request Card. Our Reader Service Department will be glad to help you.

•

Contractors and Engineers Monthly
470 Fourth Ave.
NEW YORK 16, N. Y.

Suspension Bridge Carries Gas Pipeline

Atchafalaya River Crossing Under Way as Deep Caissons Are Sunk for Main Piers; Span Totals 4,678 Feet

+ PETROLEUM gas in its natural form will soon be piped across country from Texas to New York City. One of the great rivers to be crossed with the pipeline is the Atchafalaya in southern Louisiana. Most rivers are crossed by laying the pipe in a trench dug into the river bottom. The Atchafalaya has several such submarine crossings, but because of its depth and swift current this method is not entirely satisfactory. Maintenance of the pipeline is costly and troublesome.

Accordingly, Transcontinental Gas Pipe Line Corp. of Houston, Texas, which is supplying natural gas to the northeast, is building a suspension bridge across the Atchafalaya to carry twin 30-inch-OD pipelines through which the gas will flow. The pipeline suspension bridge is north of Melville, a town on the west bank of the river in St. Landry Parish. The eastern bridgehead is in Point Coupee Parish.

Fish Constructors, Inc., of Houston, Texas, is supervising the construction for Transcontinental. A contract for the substructure was awarded to the Kansas City Bridge Co. of Kansas City, Mo., for $1,011,140. The Massman Construction Co., also of Kansas City, is participating in this contract as a joint venture of the two contracting firms. A contract for the superstructure has been awarded to the American Bridge Co. of Pittsburgh, Pa., on a low bid of $849,747. Construction started on February, 1950, and the bridge is expected to be completed by the end of 1951. Since the natural-gas pipeline from Texas to New York is scheduled for completion by this month, Transcontinental will lay three 12-inch pipelines across the Atchafalaya River bottom to be used until the bridge carrying the permanent pipelines is finished. Only one of the two 30-inch lines is expected to be put in service in the immediate future.

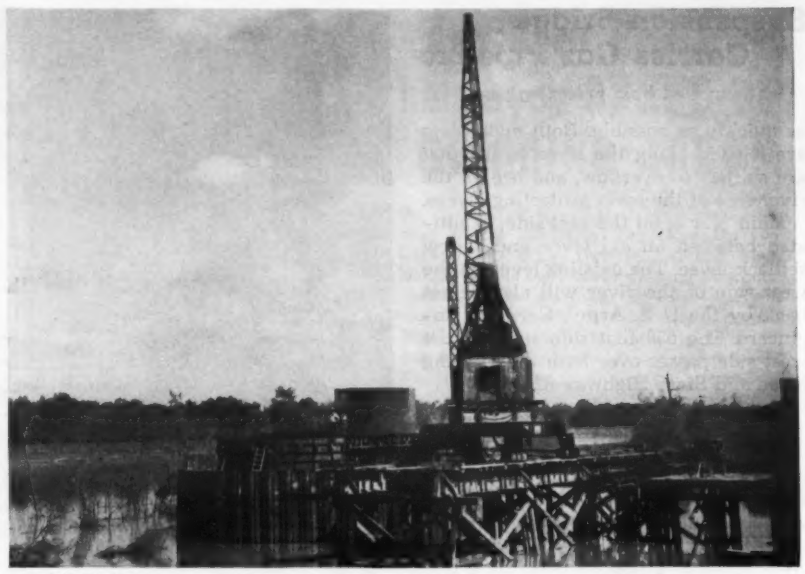
High-Level Crossing

The multiple-span pipeline suspension bridge is 4,678 feet long, center to center of main anchorages, with a main central span of 2,000 feet. From west to east in order across the structure is a 60-foot span from main anchor 1 to rocker bent 1; a 498-foot backstay span from rocker bent 1 to rest pier 1; a 650-foot side span to main pier 1; the central 2,000-foot span to main pier 2; a 1,000-foot side span to rest pier 2; a 410-foot backstay span to rocker bent 2; and a final 60-foot span ending at main anchor 2. At the bridge site the Atchafalaya is 980 feet wide between banks, with its depth varying up to 125 feet.

Record high water in the river has been at 46.3 elevation (mean sea level) with a velocity of 4.6 mph. Usual high water is at 37.0 elevation, accompanied by a 3.5-mph velocity. An extreme high water of 50.3 elevation can be expected; mean low water is 6.3 elevation. The bottom of the pipeline at the center of the bridge will be at elevation 108.0.

Included in the substructure contract is the construction of the two main piers, two rest piers, two rocker bents, two main anchorages, and four 30-inch-OD pipeline anchors. In the order of construction, preference was given to the two main piers so that erection of the steel towers might get under way

(*Continued on next page*)



C. & E. M. Photo

An American revolving crane with a 100-foot boom works from a falsework trestle next to main pier 2 on the east side of the Atchafalaya.

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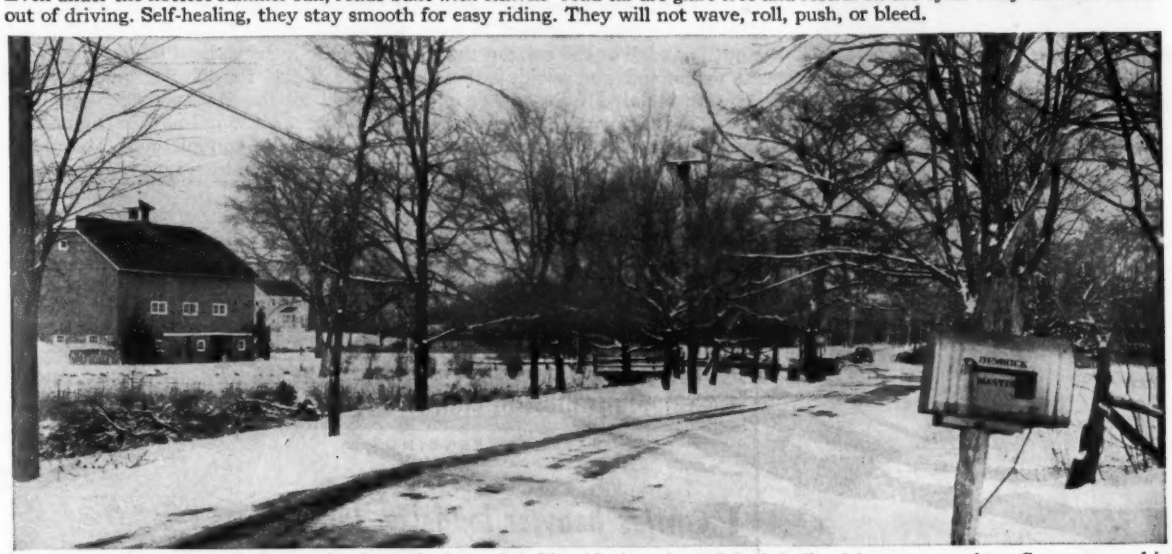

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Suspension Bridge Carries Gas Pipeline

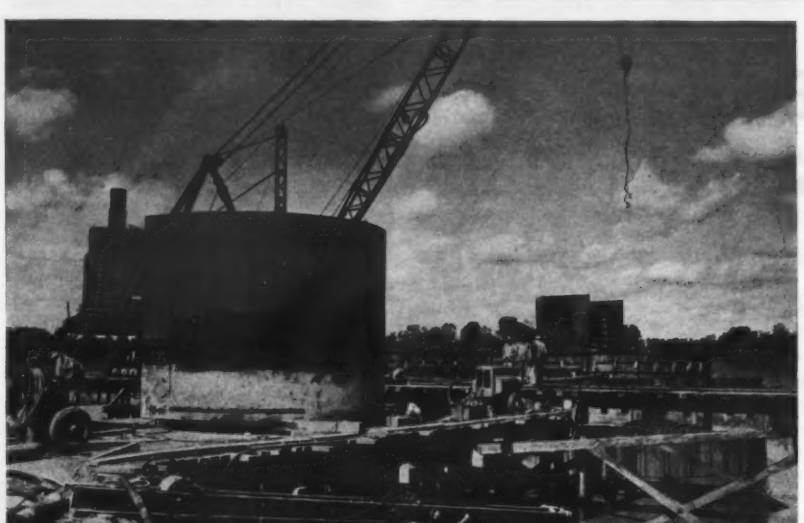
(*Continued from preceding page*)

as quickly as possible. Both main piers are located along the river banks that are subject to overflow, and are on the river side of the main protecting levees.

Main pier 2, on the east side, is situated between an old levee and a new setback levee. The existing levee on the west side of the river will also be set back by the U. S. Army, Corps of Engineers. The 650-foot side span on the west side passes over both the existing levee and State Highway 824.

Main Pier 2

Construction got under way first at main pier 2 on the east bank. To reach the site a timber trestle, 125 feet long, was built out from the existing setback levee to connect with the original main river levee at a point where these two embankments were closest together. About ¼ mile farther along this levee, another short section of trestle was constructed out from the old fill, on which the heavy equipment was set up to construct the pier. The method followed involved first the building of a steel-sheet-pile cofferdam, and backfilling it with sand to form an island, within which a caisson was sunk down to minus 137.0 elevation; the top of caisson is at elevation 28.5.



C. & E. M. Photo

Here is a portion of the sheet-pile cofferdam and the steel caisson form within which the first lift of pier concrete has been placed for the Atchafalaya River bridge.

About 10 feet of water was covering the riverbank when the cofferdam was built for main pier 2. Carnegie M115 and M116 steel sheeting in 35 and 40-foot lengths was driven 20 feet into the ground to form an elliptical-shaped cofferdam approximately 76 feet long by 50 feet wide. Driving was done by a McKiernan-Terry 9B3 hammer which was handled by an American oil-burning steam revolving crane equipped with a 100-foot boom. Then, using a clamshell bucket, the rig backfilled the cofferdam with sand to within about 8 feet of the top which was a few feet above the level of the water at that time.

The sand fill was carefully leveled off within this working chamber to receive the cutting edge of the caisson that had been assembled and welded together. The Consolidated Western Co. of Orange, Texas, furnished the steel cutting edge. Then the caisson was sunk through layers of clay and fine sand to a stratum of medium to coarse sand and gravel. At each end of the caisson was an 18-foot-diameter dredging well through which material was excavated by the clamshell in the sinking process. A Union 600-gpm pump driven by a Cummins diesel engine was used for jetting away the sand under the cutting edge as the caisson was sunk.

Steel forms served as the sides of the caisson. They were supplied by the Kansas City Structural Steel Co., and were assembled in sections 12 feet high. The first lift of reinforced concrete that was poured above the cutting edge was 11 feet 3 inches high; the rest of the concrete above that was poured in 10-foot lifts. All concrete except the seal at the bottom of the caisson is reinforced. Dunham Wilson Co. of Baton Rouge supplied the reinforcing steel.

Concrete Handling

All the concrete for the bridge substructure is being furnished by Dunham & Price, Inc., of Baton Rouge. For pours on the east side of the river, a batch plant was set up at Ravenswood on a siding of the Texas & Pacific Railway, a 4-mile average haul from the job. Sand and gravel for the aggregate was supplied by the Halloway Sand & Gravel Co. of Jackson, La., and delivered to the plant in gondola cars. The material was unloaded by a Lorain 77 crane with a 60-foot boom and a 1½-yard clamshell bucket, and either stockpiled or stored in a Blaw-Knox 60-yard 3-compartment bin. Two of the compartments hold gravel, and the third holds sand.

Lone Star bulk cement was also shipped in by rail from New Orleans, and stored in an Erie 600-barrel cement bin. A fleet of eight batch trucks holding three 1-yard batches delivered the cement and aggregate to the structure that is under way. Concrete was mixed either in a Koehring 27-E paver or a 2-yard Mixermobile; water was pumped from the river for the mix by a Deming 3-inch pump. For concreting operations on the west side of the river, the batch plant was set up near Melville.

Concrete was discharged into bottom-dump buckets which were lifted to the forms by the crane rigs. Forms had previously been unwatered by a battery of pumps that included Sterling 2, 3, and 4-inch units, and a Carver 1½-inch pump. As the concrete was placed it was vibrated with Ingersoll-Rand

(*Concluded on next page*)

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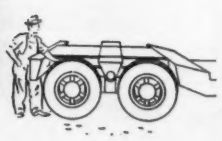

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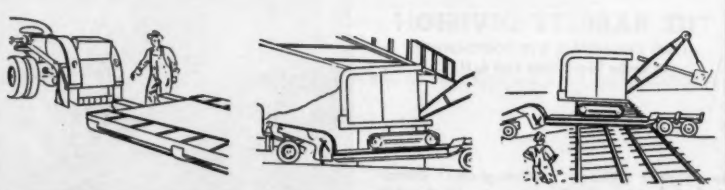

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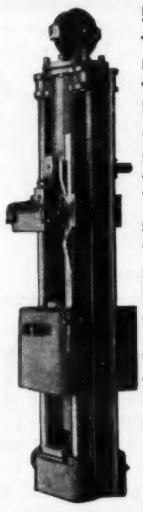

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pneumatic vibrators powered by a Schramm air compressor. After the forms are stripped the concrete is painted with Duocrex to reduce skin friction as the caisson is sunk.

Steps in the caisson work include excavating material through the dredge wells; sinking the caisson pier; adding another lift of concrete, followed by the same procedure all over again. After the caisson is sunk, a concrete seal 20 feet thick, extending 2 feet below the bottom of the cutting edge, is poured. From the top of the caisson at elevation 28.5, two piers 10 feet in diameter rise 24 feet to elevation 52.5; they are connected by a curtain wall.

Other Structures

Main pier 2 is nearly similar to main pier 1, except that the caisson for pier 2 goes down 6 feet deeper than the caisson for pier 1. Rest piers, rocker bents, and anchorages are all supported on steel bearing piles delivered to the job by barge from the Carnegie-Illinois Steel Co. in Pittsburgh, Pa. The piles are either 8, 12, or 14-inch H-beams. In the construction of anchorage 2, a steel-sheet-pile cofferdam, 27 x 57 feet, was driven that served as a form for the concrete. Inside this cofferdam 67 H-beam piles—14-inch at 73 pounds—were driven down to minus 105.0 elevation by a Vulcan 50-C hammer, working in steel leads. The concrete anchorage is 41 feet deep in front and steps down to 19 feet at the back. The steel piles go 5 feet into the concrete.

Other crane rigs on the job include a Wiley Whirley with an 80-foot boom; a 3500 Manitowoc Speedcrane with a 100-foot boom; and two Bucyrus-Erie cranes—a 22-B and a 38-B. They were used on material handling, excavation, pile driving, and concrete placing. Three different strengths of concrete were used in the substructure: 2,500-pound, 5 bags to the yard, in the anchors; 3,000-pound, 5½ bags to the yard, in the caissons; and 4,500-pound, 6½ bags to the yard, in the seal.

The structural-steel main towers are 215½ feet high from the top of the concrete piers to the PI of the centerline main-cable tangents. The towers are constructed with ½-inch gusset plates and ⅞-inch rivets. Each of the main cables is made up of nine 1¾-inch galvanized bridge ropes.

Personnel

The Kansas City Bridge Co. employed an average force of 40 men on the substructure contract under the direction of Fred Fredricksen and Louis Grieble, Superintendents, and George Morgan, Project Manager.

For Fish Constructors, Inc., Frank Stubbs is Bridge Engineer assisted by Ralph Gagnard, Resident Engineer.

Ball-and-Socket Coupler For All Light Trailers

A 4-page folder describing a variety of Bull Dog couplers with capacities ranging from 1 to 10 tons, has been issued by the Hammer Blow Tool Co., P. O. Box 419, Wausau, Wis. These ball-and-socket couplers are designed for adaptation to almost any type of industrial, commercial, or equipment trailer, and for both wood-frame and pipe tongues of various types. The catalog points out their features and includes complete specifications, illustrations, and price lists.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 9.

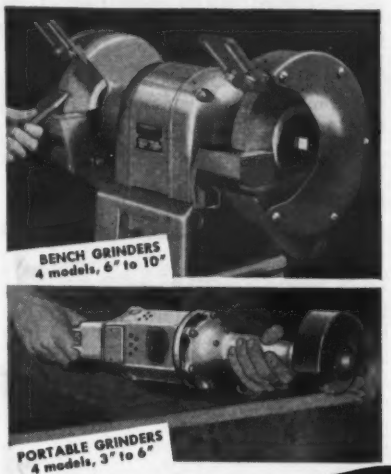
Caterpillar Representative

D. G. Blattner succeeds M. A. Galvin, who has resigned, as special representative in engine application for the Eastern Sales Division of the Caterpillar Tractor Co., of Peoria, Ill. He joined Caterpillar in 1947 as a college-graduate trainee.

Welding Handbook

Now in its ninth edition, the "Procedure Handbook of Arc Welding Design and Practice", published by The Lincoln Electric Co., has been completely reorganized and re-edited to bring all information up to date. New design data have been included to make the handbook more valuable to designers of welded machines and structures. The latest procedures are given for welding all metals and alloys commonly welded with manual open-arc and hidden-arc welding as well as automatic and semi-automatic hidden-arc welding. A chapter on weldability is included.

This book is intended to serve as a reference handbook for designers, engineers, shop supervisors, and welding operators, and as a text in schools and colleges. It contains over 1,200 pages with more than 1,300 photographs and drawings. It may be obtained from the Lincoln Electric Co., 12818 Coit Road, Cleveland, Ohio. The price in the United States is $2.00; elsewhere, $2.50.



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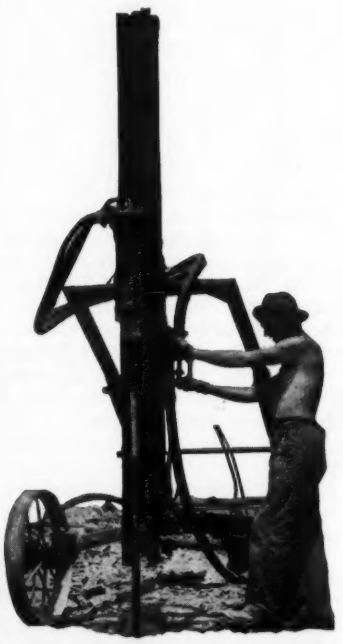
Rigged with husky wire rope, power shovel takes huge bites of earth during rough grading.



Drill steel paves the way for blasting, to remove barrier of rock.

5 Miles of Relocation on U.S. 122

To cope with a steadily-mounting volume of traffic north of Reading, Pa., approximately five miles of U. S. Route 122 were recently relocated between Leesport and Hamburg. The new stretch of highway has two 24-ft lanes, separated by a 4-ft concrete divisor. Its construction included the erection of a bridge, a reinforced-concrete arch, and three culverts. Contractor for the project was C. W. Good, Inc., Lancaster, Pa. Bridge reinforcing, bar mats and dowel units were supplied by Bethlehem.

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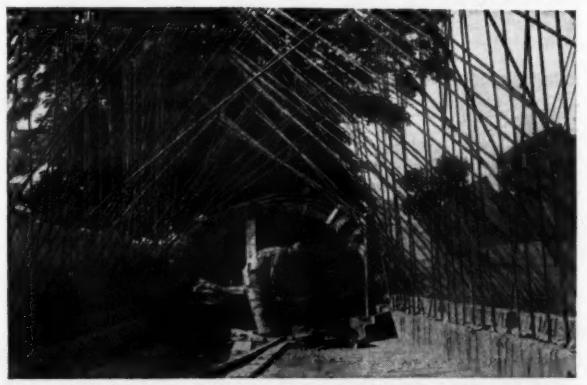
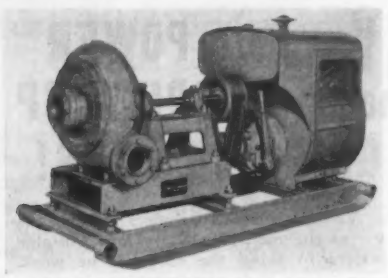
BETHLEHEM STEEL

The 5-mile stretch of highway includes a reinforced-concrete arch, which is shown above. Rough grading for the new roadway completed in background.



Network of Bethlehem Reinforcing Bars, shown in place in one of three culverts. The entire project used more than 100,000 lb of reinforcing bars.

With Bethlehem Reinforcing Bars bent to shape and securely tied, bucket of concrete is brought into position for initial pour. Crew stands ready.



The Lightning engine-driven pump for sand and gravel is designed for portability and top capacity.

Engine-Driven Pump For Sand and Gravel

The new Lightning engine-driven pump developed by the Kansas City Hay Press Co., 801 Woodswether Road, Kansas City, Mo., is designed for portability and top capacity. It is for use in quarries, strip mines, underground mines, and wherever else pumping of water-aggregate combinations is necessary.

To provide quick operation for emergency pumping, foot-valve priming has been eliminated. A new self-priming device utilizes the vacuum developed by the power unit and primes the pump by opening a single valve. While the operator primes the pump by this method, he watches a glass section in the vacuum line. At the first appearance of water, he closes the valve and engages the clutch to the pump. This operation is said to require a minimum of time and to enable one man to put the pump in operation.

Side-plate liners and the impeller of the new unit are cast of Hi-Chro-Hi for abrasion resistance. Design of the pump is such that replacement or checking of parts can be done easily, the company says. The pumps are skid-mounted and available in two sizes, 4 inches and 6 inches, with power units of 30 and 77 hp respectively. The 30-hp unit is a 4-cylinder air-cooled type; the 77-hp engine is a 6-cylinder radiator-cooled type.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 6.

Data on Fire-Fighting

An educational booklet on fire-fighting has been prepared by Ansul Chemical Co., Marinette, Wis. "Fundamentals of Fire Extinguishment" is a 4-page illustrated discussion of what fire is, the classes of fire, and proper methods of extinguishment.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 54.

A Combination Tool For Lumber Salvage

A new wrecking tool for dismantling wood structures while preserving the lumber in good condition for re-use has been announced by Calumet Steel Castings Corp., 1636 Summer St., Hammond, Ind. The Ripper Jack is a combination crowbar, pry-rod, nail puller, and sledge. It can be used in almost any position, above, or below, or at the side of the structure being dismantled. The tool has a nail puller in the head and a reversible shoe for inside or outside leverage. It is all steel and sturdily constructed, but light enough to handle on the job, according to the manufacturer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 8.

Tools for Bearings

A new set of tools for removing and installing camshaft bearings in all International wheel tractors, including the 14, 16, 18, and 24 Series diesels, has been announced by Owatonna Tool Co., 381 N. Cedar St., Owatonna, Minn. The set consists of ten driving collars and a 53-inch 2-section driving handle in a substantial metal case. Set No. HC-22R is designed and engineered especially for these tractors and is recommended by the International Harvester Co.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 92.

New Goodrich Warehouse

The B. F. Goodrich Co. has broken ground at I Street and Erie Avenue, Philadelphia, for the new steel building which will house its district offices, central warehouse, and retail store to be completed by next May. Among the units of the company which will occupy the building are the Replacement Tire Sales Division and the Industrial Products Sales Division, which handles belting and hose of all types. Lewis C. Bowers & Sons, Inc., of Princeton, N. J., is the contractor.

Equipto's tilt-type dividers for parts storage are kind to the knuckles.

Parts-Bin Dividers

A new type of divider for parts bins and drawers is made by Equipto, Aurora, Ill., manufacturer of steel shelving. This new tilt-type divider speeds operations, gives full visibility regardless of how full the drawer is, and saves skinned knuckles, says Equipto. It is now being supplied in all Equipto drawer units, parts bins, and other equipment. A 24-page catalog is available showing these and other Equipto equipment for storage of parts, such as shelving, racks, bins, benches, trucks, and toolroom units.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 26.

Information on Aluminum

A new illustrated booklet on aluminum has been issued by The Aluminum Association, 420 Lexington Ave., New York 17, N. Y. It outlines how "our most abundant metal" is produced and the characteristics that make it "the modern metal for modern uses". It also lists members and officers.

This literature may be obtained from the Association, or by using the Request Card at page 16. Circle No. 106.

dart High Speed Concrete VIBRATORS

TESTS PROVE THIS VIBRATOR CAN TAKE IT ON THE CHIN!

Contractors agree with the engineers who designed this *heavy duty* Dart electric vibrator that it is practically indestructible! Yes, here are just a few of the reasons:

1. Has voltage range from 102 to 120 volts. Special compensating field winding for ideal commutation.
2. In manufacture of motor, rotor is spun 30,000 r.p.m *before* varnishing to test for possible centrifugal force distortion.
3. Especially designed for maximum heat dispersion. No overheating.
4. Motor guaranteed for 4 months.

Dart Model 240 EP Electric Concrete Vibrator

See this rugged Dart concrete vibrator and you'll agree that an electric unit can be practical.

Write for literature and name of your nearest dealer

National Distributor of the Famous Cutcrete Concrete Saw

dart MANUFACTURING & SALES CO.

DENVER COLORADO

How Industrial Advertising p

FREE — 4 useful booklets for industrial executives

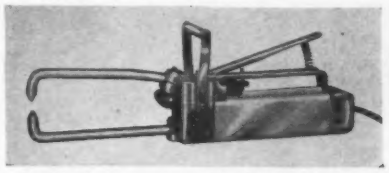
1. "How Industrial Advertising Meets the Demands of Top Management" and
2. "How Industrial Advertising Helps Make Sales"—Each describes 10 performance-facts reports from the advertising-sales records of such companies as E. I. du Pont de Nemours & Co., General Electric Company, Hercules Powder Company, Westinghouse Electric Corporation, Koppers Co., Inc., Standard Conveyor Co. Each tells how a sales situation was analyzed—how advertising was used in these situations, and what results were obtained.
3. "Copy That Clicks"—This is not just about advertising copy. Contains 20 examples that will give you a new viewpoint on advertising objectives; will help your advertising people do a better job.
4. "Mechanized Selling at Work"—Prepared for executives who would like to apply the same concrete, mathematical principles of efficient product production to the improved efficiency of order production.

Write to National Industrial Advertisers Association, 1776 Broadway, New York 19, N. Y. for these useful booklets. They're free.

Portable Spot Welder

Fast welding, easy handling, automatic switch control, and versatility are features claimed for the new self-contained portable spot welder, Model BW, now manufactured by Greyhound A. C. Arc Welder Corp., 606 Johnson Ave., Brooklyn 6, N. Y. The tool weighs 33 pounds. It can weld up to a ¼-inch combined thickness of mild or stainless steel, or 2 pieces of 16-gage galvanized metal with a combined thickness of ⅛ inch, and it can be used as a portable spot welder or converted into a stationary model.

Automatic switch control eliminates finger movement. A slight squeeze of the handle applies pressure to the welding tips. An extra squeeze of the handle automatically turns on the current. Release of pressure automatically cuts off the current and separates the welding tips. The protruding copper welding arms are available in 3 interchangeable lengths—6, 16, and 18 inches—as well as in a variety of special shapes and sizes. For heavy-gage intermittent production, Greyhound can furnish special water-cooled arms and tips. When the welder is mounted on a metal stand, operating pressure is applied through a foot pedal, thus freeing the operator's hands.



A slight squeeze on the handle of the Greyhound BW spot welder applies pressure to the welding tips. An extra squeeze turns on the current.

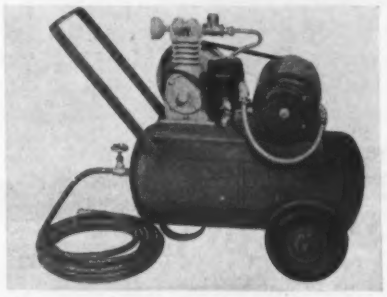
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 58.

N. Y. Builders Inventory Equipment for Civil Defense

In the event of a bombing attack on New York City, heavy equipment would be badly needed for removal of debris from streets, demolition of unsafe structures, emergency repair of streets and utilities, and rescue work.

An inventory of such equipment in metropolitan New York is now being compiled by the 1,000 contractors affiliated with the Building Trades Employers' Association. Individual contractors are doing the tabulating for inclusion in an overall inventory maintained by Commissioner F. H. Zurmuhlen, Director of the Public Works Emergency Division.

The inventory will also include a list of key personnel of contracting firms, such as engineers, superintendents, and foremen, who would be called on to direct the operation of the equipment.



Airmaster compressors come in 1 and 2-cylinder models with a displacement of 2.8 and 8-cfm respectively.

Small-Displacement Portable Compressor

Airmaster portable compressors made by Decker Mfg. Co., 1119 Parmele St., Rockford, Ill., come in single-cylinder models with a displacement of 2.8 cfm and a 2-cylinder model, with an 8-cfm displacement. Gasoline-engine or electric-motor drive is available.

The tanks are of heavy-gage steel and have an automatic pressure switch. They carry a 10-foot cord with a rubber-coated plug. The air hose is 25 feet long with an air chuck. All fittings are of brass, according to the manufacturer. All wiring is BX enclosed and the wheels are semipneumatic ball-bearing. One of the safety features is a secondary pop-off valve which can be preset at any pressure within the capacity of the tank.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 60.

Heavy-Duty Construction Fabrication Facilities

A new 44-page booklet describes the facilities and products of the Newport News Shipbuilding & Dry Dock Co., Newport News, Va. This firm, the catalog points out, which is principally noted for its construction of ships, has since 1886 also developed a wide range of facilities for producing equipment to meet individual specifications.

Included in its engineering and design divisions are over 400 engineers and draftsmen, trained and experienced in engineered construction. The steel-fabricating shops of the company include modern machines for making almost any variety of steel shapes, and radiographing equipment and stress-relieving furnaces for testing and treating steel assemblies. The sheet-metal shops are equipped to fabricate and assemble light metals from 1/64 to 1⅛ inch in thickness, the booklet says. Extensive research work conducted in the company laboratories has resulted in development of new materials, methods, and techniques, according to the booklet.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 76.

Data on Worm-Gear Drives

The new 80-page book No. 2324 released by Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill., illustrates and describes three basic worm-gear drives. Each drive is available in 10 different sizes, for fractional or large horsepower, and in speed ratios of 3⅝ to 1 up to 8,000 to 1.

Features enumerated for these enclosed right-angle drives are: compact design, antifriction bearings, automatic splash lubrication, high ratios in small space, operation at high input speeds, quiet performance, and their availability for vertical or horizontal driving. Pages 10 through 15 of the catalog contain typical drive problems with their solutions and show the ease with which the proper drive may be selected for a specific duty.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 45.

...ing paved the way for Low Cost Roads!

Low cost roads are coming in—thanks to an amazing machine with a mouth-filling name: the Single Pass Soil Stabilizer.

Ever hear of it? Road builders never had, either—till *advertising* paved the way. *For more than a full year* before the product was marketed, advertising got busy to tell them what it was and what it would do.

Result: when the machine was ready for market, the market was ready for *it*—the first step of the salesman's job was over!

A Hard-Boiled Market

It wasn't easy. For one thing, "soil stabilization" took some explaining. It had to be shown that this new machine would build roads using native soils as the basic material . . . with a minimum of costly commercial materials hauled in from a distance.

"Single pass" was another thing. Contractors had come to think of this kind of road building in terms of an army of equipment . . . plows, discs, harrows going back and forth. Here was *one machine* that promised to do *all* these jobs at once—faster and better.

Well! *Now* Single Pass Soil Stabilizer made sense! Road builders sat up and took notice. Inquiries poured in—from the people who counted—the "hard-boiled" market had softened.

Finding—and selling—the people who count

Today, soil stabilization has really taken hold. Here in America, in England, West and South Africa, Venezuela, Brazil . . . the big machines are at work . . . spinning out new roads behind them . . . stretching highway dollars with fine pavements of uniform high quality and predetermined strength.

Advertising paved the way for salesmen. It told and it *sold,* at far less cost than salesmen could have done it. Another example of industrial advertising doing its most important job—reducing the cost of *selling!*

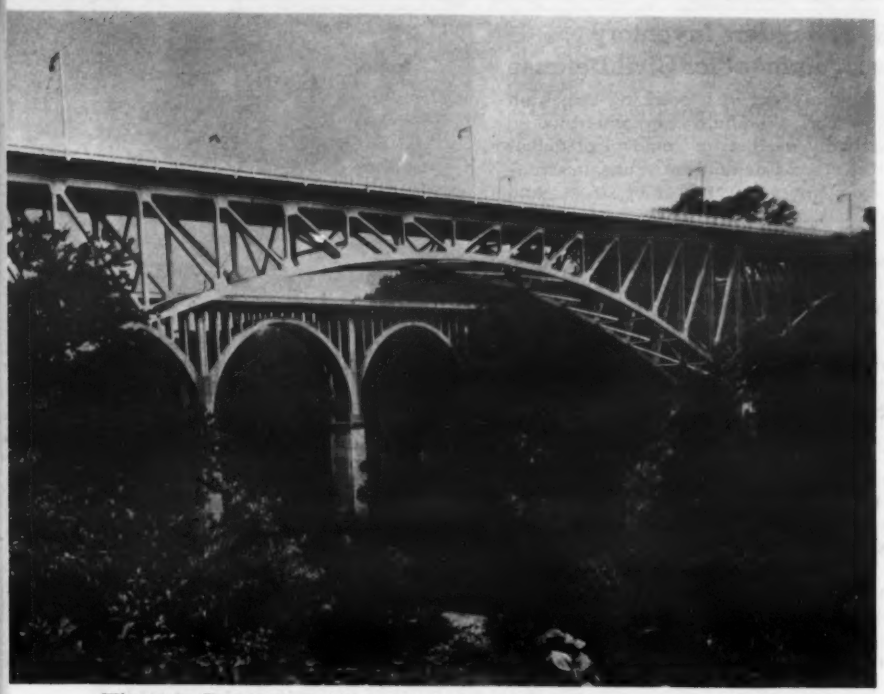
* * * *

• *This message—one of a series by members of the National Industrial Advertisers Association—is published by* CONTRACTORS & ENGINEERS MONTHLY *to create a wider understanding of industrial advertising and the contribution it is making to American industry.*

Milwaukee Industrial Marketing Association

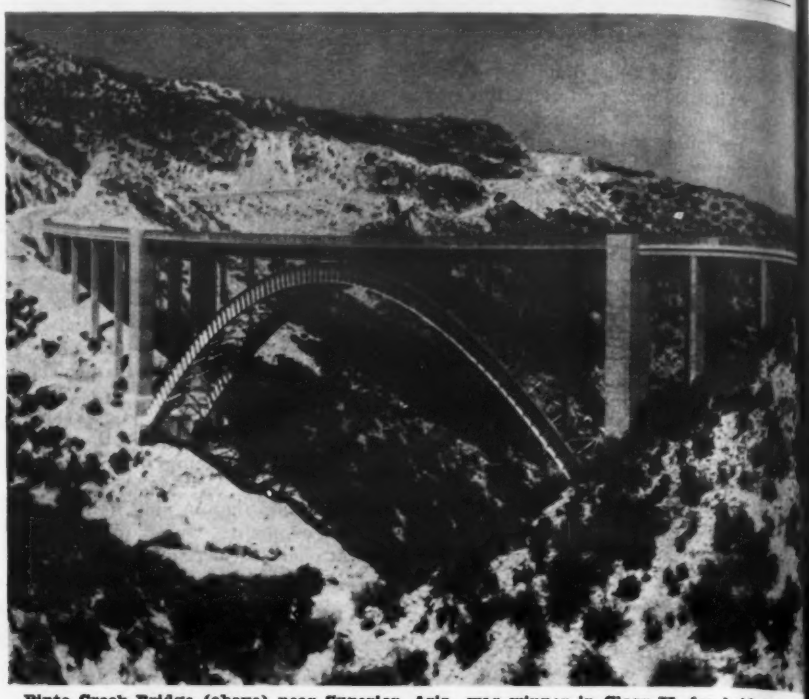
A CHAPTER OF THE NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION

A national organization, comprised of 3,500 members of the 34 local associations of industrial advertising and sales executives — dedicated to greater efficiency in industrial distribution — and lower sales cost.



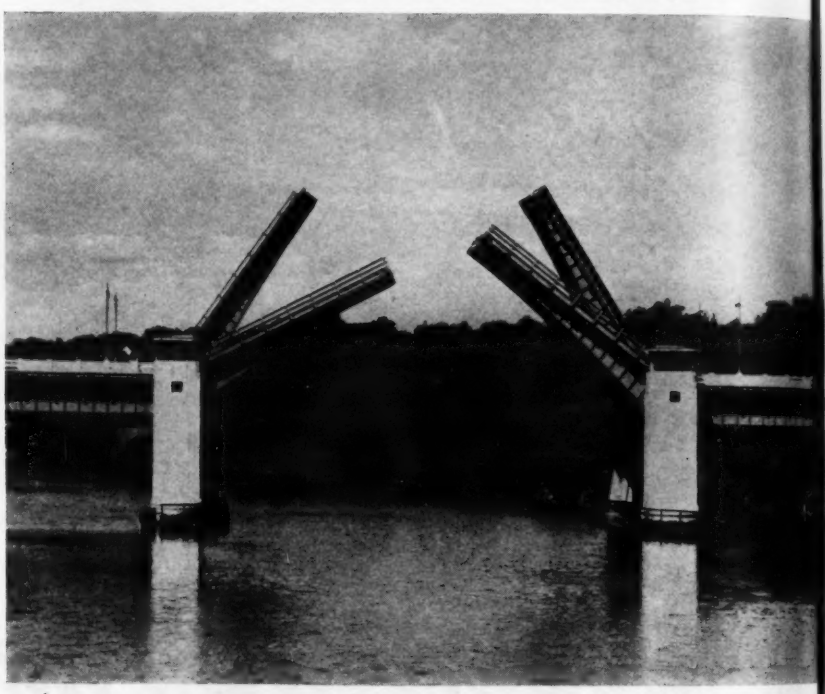
Winner in Class I, for bridges with spans of 400 feet or more, was the North Main Street Bridge (above) linking Akron to Cuyahoga Falls. Summit County, Ohio, owns it. Wilbur Watson Associates designed it. Bethlehem Steel Co. was the fabricator.

In Class III, for bridges with spans under 400 feet, costing less than $500,000, Tenth Street Bridge (below), on the Atlanta Expressway, won. Owner, Georgia State Highway Department; designer, Robert & Co. Associates; fabricator, Virginia Bridge Co.

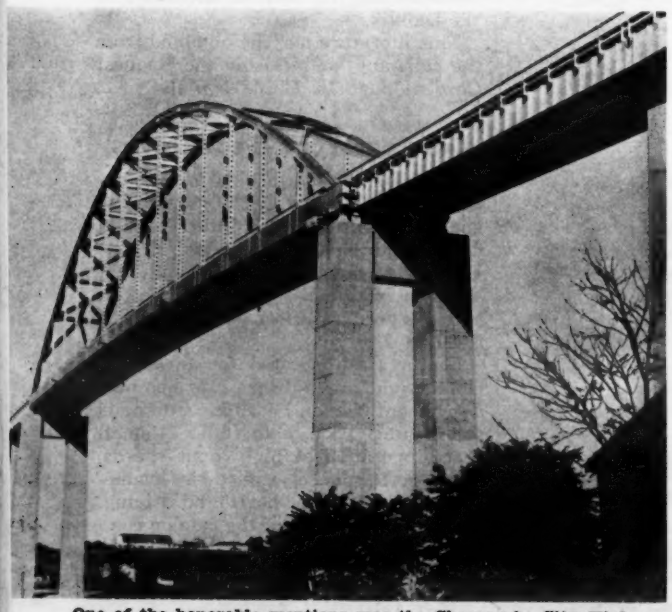


Pinto Creek Bridge (above) near Superior, Ariz., was winner in Class II, for bridges with spans under 400 feet, costing over $500,000. The Arizona Highway Department designed and owns the bridge. Allison Steel Mfg. Co. did the fabricating.

Winner in Class IV for movable bridges was this Passaic River crossing (below) on Route S-3 between Clifton and Rutherford, N. J. The New Jersey Highway Department designed and owns the bridge. Morris Goodkind was Bridge Engineer.



Steel Bridges Win AISC Awards



One of the honorable mentions was the Chesapeake City Highway Bridge over the Chesapeake & Delaware Canal in Maryland. Parsons, Brinckerhoff, Hall & Macdonald designed it; the American Bridge Co. fabricated it; the U. S. Government owns it.

Selected as Most Beautiful Steel Structures Opened to Traffic in U. S. in 1949

✦ THE American Institute of Steel Construction has picked what it considers the most beautiful steel bridges opened to traffic in the United States in 1949. Winners out of the 46 entries are the top four bridges pictured here.

There were three honorable mentions besides the two pictured at either side of this column. In Class III, the Watauga River Bridge in Johnson County, Tennessee, won first honorable mention, and the East Henrietta-Rochester Bridge in New York's Monroe County won second honorable mention. South Capitol Street Bridge in Washington, D. C., was the honorable mention in Class IV.

The jury of awards included Professor Robert L. Lewis, of the College of Engineering of New York University; Walter E. Jessup, Editor of *Civil Engineering;* Kenneth Franzheim, of Houston, Texas; Eero Saarinen, of Bloomfield Hills, Mich.; and Lt. Col. Max Abramovitz of New York.

This honorable mention is the Bataan-Corregidor Memorial Bridge over the Chicago River. The City of Chicago owns it. The Chicago Department of Public Works designed it, with S. J. Michuda as Bridge Engineer. American Bridge Co. did the fabricating.

Baer's new free-running dragline dump block is designed to cut the digging cycle of its machine.

Dragline Dump Block

A new free-running dragline dump block said to help cut the digging cycle of its machine is now being produced by Baer Steel Products, Inc., Auburn, Wash. The block sheave turns on an oversize roller bearing to give full dumping force to the bucket load when its dragline is slacked off. To prevent fouling or fraying of the fast-moving dump line, the housing throat is faired into the sheave ropeway. The rope is confined and cradled to assure positive seating at any rope tension, the manufacturer says.

Firmly locked retainers seal the Zerk-lubricated bearing to permit continuous use of the block in underwater digging if necessary. Housing and sheave are cast Fibraloy to provide toughness at high hardness levels.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 68.

New Speed Reducer

A new Heliocentric speed reducer for applications in the ¼ to 1-hp range has been announced by the Universal Gear Corp., 19th and Martindale, Indianapolis 7, Ind. Designated the Model 5-E, the new unit is suitable for any straight-line installation in which the input rpm does not exceed 1,800. Maximum torque capacity is 1,000 inch-pounds. Overall design is compact and streamlined, according to the manufacturer, to conserve installation space. Features include the use of antifriction ball bearings throughout, simplified design, and reduction in the number of working parts.

Further information on the Heliocentric speed reducer may be secured from the company. Or use the Request Card at page 16. Circle No. 46.

Text on Structural Theory

The fourth edition of "Structural Theory" introduces the reader to the basic concepts and principles of structural theory relating to trusses, rigid frames, and space frameworks. Its scope is somewhat more than the usual two or three-semester undergraduate course in stress analysis offered by engineering schools. Authors Hale Sutherland and Harry Lake Bowman have made extensive revisions in the chapters dealing with slope and deflection, rigid frames, and indeterminate trusses.

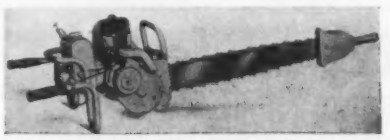
The introductory chapter contains a review of basic mechanics, rules for computation work, and a sample problem solution. Revision of this chapter has added a brief consideration of the use of the virtual work theorem—an addition made necessary by current technical discussions. The importance of influence lines in stress analysis and in facilitating a detailed understanding of truss action has justified their extensive use in the chapter dealing with truss and girder bridges and with long-span bridges. A notable change in the chapter on slope and deflection is the addition of the solution of compound trusses by means of the Williot-Mohr diagram. The new text also treats graphic statics, roof trusses, truss and girder bridges, lateral bracing and portals, wind stresses in tall-building frames, indeterminate trusses, and secondary stresses.

This text is published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. The price is $5.00.

Data on 1-Yard Excavator

Bulletin No. 400 describing the Marion Type 43-M machine, an all-purpose 1-cubic-yard excavator, is being offered by Marion Power Shovel Co., Marion, Ohio. It lists and illustrates the 43-M's varied applications as a shovel, dragline, clamshell, crane, backhoe, and pile driver. Features claimed for the unit include ease of front-end conversion; 22 important friction points equipped with ball or roller bearings; shafting of alloy steel; machine-cut heat-treated gears; forged crawler rollers and crawler pads; Marion air control; and independent boom hoist as standard equipment.

This literature may be secured from the company. Or use the request Card at page 16. Circle No. 114.



R-P Model 50 chain saws for both one and two-man operation have cutting capacities from 20 to 60 inches.

New Gasoline-Driven Portable Chain Saws

A new line of 5-hp gasoline-driven chain saws has been announced by Reed-Prentice Corp., 677 Cambridge St., Worcester 4, Mass. The new R-P Model 50 chain saws are available for both one and two-man operation. One-man models range in cutting capacity from 20 to 36 inches, while two-man models equipped with an idler-type tailstock are offered in 24, 30, 36, 48, and 60-inch capacities. All blade lengths are interchangeable.

Compact design and the use of magnesium parts wherever possible afford maximum cutting power at weights easily handled, the company says. Handlebars and the float-type carburetor remain upright for all operations, as the engine and cutting attachment swivel a full 360 degrees and lock at any angle for notching, felling, and underbucking cuts. Narrow, solid guidebars that reduce binding, and fast-cutting planer chains that require no jointing or setting are standard equipment on R-P gasoline saws. The R-P automatic clutch stops the chain when the engine is idling and provides overload protection. A pressure-fed oiling system lubricates the chain.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 25.

Construction Leaders Name National-Security Advisers

Leaders of the construction industry met recently at the U. S. Chamber of Commerce to form two special committees to cooperate with the Federal government on national-security problems involving construction. Both are subcommittees of the Chamber's Construction and Civic Development Department Committee.

One is the Subcommittee on Construction Mobilization, whose chairman is Ralph Walker of New York, President of the American Institute of Architects, and whose vice chairman is Carlton S. Proctor of New York, Past Vice President of the American Society of Civil Engineers. The other is the Subcommittee on Construction Credit, whose chairman is Francis G. Addison, Jr., of Washington, President of the Security Savings & Commercial Bank.

Engineering Firm Expands

Stone & Webster, Inc., now has a Canadian subsidiary, Stone & Webster Canada Ltd., with offices at 50 King Street W., Toronto, Ontario. Alfred T. Krook, previously Southwestern District Manager, is President of the new company.

Esco Ups Seattle Man

J. E. McQuaid has been promoted from Seattle Branch Manager to a position in charge of sales of the Contractor's Equipment Division of Electric Steel Foundry Co., Portland, Oreg. He will take over about the first of December. Wilson V. Latimer succeeds McQuaid.

LUG-ALL
All Purpose
WINCH-HOIST
WEIGHS ONLY 8½ LBS., YET LIFTS, PULLS OR LOWERS 1½ TONS DISTANCE OF 7½ FT., OR ¾TON DISTANCE OF 15 FT.
LUG-ALL has a built-in 'snatch block' and three swivel hooks for work around corners or in cramped quarters as close as 10½ inches. No brake to slip. 133 ft. stand flexible aircraft cable. SAFETY HANDLE prevents accidental overload.
AND IT COSTS ONLY
$99.50
WEIGHT 8½ LBS
CAPACITY 1½ TONS
LOWER FIRST COST
LOWER MAINTENANCE COST... THAT'S LUG-ALL

THE LUG-ALL COMPANY
Wynnewood 2, Pa.

Specify KORK-PAK Joint Filler for use between floor slabs and footings in basementless houses and structures on grade and get the extra KORK-PAK insulating feature as well as a waterproof, resilient, non-extruding filler that will keep the joint effectively filled at all times.

KORK-PAK is composed of cork granules bonded together with asphalt between two sheets of asphalt-saturated paper—it's waterproof and insect proof to assure positive joint filling for the life of the building.

KORK-PAK is the least expensive non-extruding joint filler made—low cost, coupled with its high insulation coefficient makes KORK-PAK the ideal joint filler for any type of construction.

SERVICISED QUALITY PRODUCTS 1920

Write for complete details on KORK-PAK. See our Catalog in SWEET'S.

SERVICISED PRODUCTS CORP.
6051 W. 65th ST., CHICAGO 38, ILL.

With the profitable combination shown above you can recover valuable, saleable sand that may now be going "down the drain." Dakota Sand & Gravel Co., Bismarck, N. D., uses an Eagle Water Scalping Tank to concentrate water borne sand and an Eagle Double Screw Long Weir Washer-Classifier-Dehydrator to wash, classify and dewater sand.

At Dakota, gravel is conveyed to an elevated wet screen. Material passing the bottom deck of the screen flows into an Eagle Water Scalping Tank. Solids quickly precipitate and flow to the Eagle Screw Washer below, through adjustable gates on the bottom of the tank. The dirty water flows over a weir to waste. Design of the scalping tank is based upon long experience and experimentation — one of those "things that couldn't be done." The water heavily charged with sand which is deposited in the screw unit, is quickly processed — the wash water flowing over the adjustable long weir at the lower end of the tub and the sand carried to the discharge at upper end of tub. The sand comes out clean and dewatered, and fed to conveyor belt stockpiler. Fines can be retained by raising weir on tub to increase head and reduce velocity — adjustable weir length flows off more or less fines. Many sand and gravel producers are now profiting from this combination.

Send for literature — Washer Cat. 47, Scalping Tank Bulletin 150.

Investigate the Eagle "Swintek" Dredging Ladder — agitates bonded material, screens nozzle against boulders, carries oversize out of pumping zone. Catalog 745.

SINCE 1872 Progress...Service

EAGLE IRON WORKS
159 Holcomb Ave. • Des Moines, Iowa

Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Engineer Dismissed Because Couldn't Get State License

THE PROBLEM: *Under the circumstances stated below, could a jury have properly concluded that an engineer employed as a "civil engineer for constructural steel and concrete designs for mechanical layouts and map work" was justifiably discharged (1) on the ground that he was unable to secure a state license as an engineer, or (2) for incompetency and misconduct?*

THE ANSWERS: (1) No. (2) Yes. (Masonite Corporation, appellant-defendant, v. Handshoe, plaintiff-appellee, 44 So. 2d 41, decided by the Mississippi Supreme Court.)

Plaintiff was employed for work in California, where he lived, under a contract indefinite as to duration. He moved to Mississippi under a contract that was to run for at least one year. He was discharged within that time and sued for damages. The trial court ruled that he was unjustifiably dismissed. On the employer's appeal, the decision was set aside and a new trial ordered on the ground that the trial judge erred in refusing to permit the jury to say whether or not, on the conflicting evidence presented, the discharge was justifiable.

(1) The higher court decided that the employer could not justify the discharge on the ground that plaintiff did not have a license as a civil engineer, because it knew that he did not have one when he was hired, and because it was not certain when he was hired that he would render services in a state where a license would be required.

The Mississippi Supreme Court stressed the fact that the employment contract did not, as it might have done, require him to secure a license in California. (The court's decision on this point should not be relied upon as reflecting a general view of the courts that an engineer can recover damages for dismissal because he does not hold a license in the state where he is employed. In cases involving all sorts of occupations it has often been decided that a contract by an unlicensed person to render services that can be lawfully rendered only by one holding a license is void.)

(2) But the Supreme Court decided that a jury could have upheld plaintiff's discharge by his employer on the ground assigned when he was dismissed: that he was incompetent for the job, as shown by the fact that he had been unable to pass an examination for an engineer's license and was abusive to the employer's representatives in a conference concerning his qualifications.

The court said that even if the contract had not specified the qualifications required of plaintiff, the law would have inferred a guaranty by him that he was competent for the job, as to skill and knowledge; that he would do his work with reasonable efficiency and care; and that he would refrain from misconduct prejudicial to his employer's business, such as unprovoked insolence and disrespect.

Income-Tax Accounting

THE PROBLEMS: *A corporate road contractor chose to make its Federal income-tax returns on the basis of accrued obligations as against a basis of cash receipts and disbursements. A contract with a state highway commission was made and performed within a calendar year, but a 15 per cent balance due on the contract price was retained by the state until January 21, pending publication of a statutory notice permitting filing of any claims that might exist against the fund. The contractor reported the balance as income for the year in which the contract was performed and paid the Federal tax as due in that year. (1.) Was the contractor entitled to a refund of the tax on a theory that the balance should have been reported as income for the next year?*

Salaries of the company's officers, not paid within the years when they accrued, were carried on the corporate books as liabilities until paid in a subsequent year. Were they deductible as an expense for that year?

THE ANSWERS: No. (Clark v. Woodward Construction Co. 179 Fed. 2d 176, decided by the United States Court of Appeals, Tenth Circuit.)

(1.) The court said that the case was governed by the general rule of law that where a taxpayer keeps his books and makes his tax returns on an accrual basis, income accrues, for tax purposes, when right to it becomes definitely fixed, although payment may be deferred. In this case the contract work had been completed and accepted within one calendar year, and the contractor became entitled to full payment in that year, subject only to valid claims against the remaining balance of the fund. Had claims been filed against the balance belonging to the contractor, the amounts paid thereon

(*Concluded on next page*)

"BERG" Concrete Surfacer

Mode R2-AS

A light-weight, portable, electric motor-driven Concrete Surfacer consisting of the Model R-2 Right Angle Head and Model AS Motor Unit.

Ideal for surfacing concrete construction and other applications.

Quickly converted into the Model V2-AS Concrete Vibrator for internal vibration by substituting the Model V2 Vibrator Unit for the above Head.

The Concrete Surfacing Machinery Co.

4665-4669 Spring Grove Avenue, Cincinnati 32, Ohio

THIS KIND OF LOADER PERFORMANCE LEADS TO THIS KIND OF PURCHASE

Not surprising either, when you realize that these loaders handle 3 to 5 yards per minute—any loose material from sand to cinders to snow. Only one man required to operate a loader. And besides, they get from job to job at highway speeds. *Better investigate!*

Write for detailed specifications, Dept. CE-9

EAGLE CRUSHER CO., Inc. GALION OHIO-U-S-A

JAW CRUSHERS • IMPACT BREAKERS
PULVERIZERS • CONVEYORS • LOADERS

IMMEDIATE DELIVERY FROM NEAR-THE-JOB WAREHOUSES

Extensive stocks of suction hose in a wide range of sizes are carried in the Continental Warehouses listed below. Whatever your needs, you'll get prompt delivery when you call Continental.

No profit-eating delays waiting for long distance shipments.

No need to tie up your working capital in large rubber goods inventories.

Next time you need SUCTION HOSE, call the nearest Continental Warehouse. You'll like the service you get.

SEND NOW FOR CONTINENTAL'S SPECIAL CONTRACTORS' HOSE CATALOG

Rubber by CONTINENTAL RUBBER WORKS

1990 LIBERTY STREET • ERIE, PENNSYLVANIA

CONTINENTAL WAREHOUSES

BALTIMORE 1, MD. 112 West Pratt Street	CINCINNATI 2, OHIO 49 Central Avenue	LOS ANGELES, CALIF. 2037 S. Santa Fe Avenue	PITTSBURGH 21, PA. 607-609 Brushton Avenue
BOSTON, MASS. 12 Franklin Street Allston 34	CLEVELAND 15, OHIO 2731 Prospect Avenue	MEMPHIS 3, TENN. 268 Madison Avenue	SAN FRANCISCO 3, CAL. 450 Potrero Avenue
BUFFALO, NEW YORK 115 Clinton Street	DETROIT 8, MICH. 5423 12th Street	NEW YORK 7, N. Y. 147 Chambers Street	ST. LOUIS 8, MO. 4018 Olive Street
CHICAGO 10, Ill. 10-18 W. Hubbard Street	INDIANAPOLIS 2, IND. 1401 N. Illinois	PHILADELPHIA 5, PA. 311 North Randolph Street	SYRACUSE 2, N. Y. 211 W. Jefferson Street

would have been deductible by the contractor in income-tax return as business expense.

(2.) As to deferred payment of salaries, the case was governed by the same general rule. Absolute liability having risen in the respective years in which the salaries were earned, deductions should have been claimed in those years and not in the later years in which payment was made.

The decision of the court affirms one rendered by the United States District Court, Wyoming, as to the second point, but reverses the lower court's holding that the contractor was entitled to report income from the construction contract in the year in which payment was received. (82 Fed. Supp. 700.)

Subcontractor's Right To Pay for Extra Work

THE PROBLEM: *A dam construction contract required the contractor to fill with concrete at his own expense space excavated beyond neat lines. Was a subcontractor, who undertook to do the concrete work called for by the prime contract, entitled to extra pay for filling spaces caused by excessive excavation by the prime contractor beyond the neat lines?*

THE ANSWER: Yes. (Moses v. Edward H. Ellis, Inc., 72 Atl. 2d 856, decided by the New Jersey Supreme Court.) The court decided:

Because the prime contractor worded the subcontract, any uncertainty as to the subcontractor's right to additional pay must be interpreted in the latter's favor.

The prime contract provided that excavation beyond pay lines due to overshooting, improper blasting, or carelessness would not be paid for. But the subcontractor's right to additional pay was not defeated by this fact. Nor was it defeated by the further fact that the subcontract referred to the prime contract for specifications as to the work to be done.

The court said that the subcontractor would not be presumed to have assented to excessive "excavations easily made by blasting but expensive of repair by concrete. Such a penalty will not be created or spelled out by mere inference when it is not clearly and unequivocally expressed in the contract itself."

The court also said that the fact that the prime contractor on one occasion paid the subcontractor for work necessitated by excessive excavation should be considered as indicating an admission of obligation to pay additional compensation.

Government Not Liable For Delays on Dam Job

THE PROBLEMS: *(1.) Government dam contractors were delayed 35 days because pipeline removal by another contractor was delayed by a delay in securing a right-of-way to which the line was to be removed—the Government had nothing to do with getting the right-of-way. Was the Government liable to the dam contractors? (2.) The contract provided that certain pipelines would be removed in time to avoid delaying the contractors, but that if they were not so removed, the time for completing the contract would be proportionately extended. Was the Government liable for delay of the contractors on a theory that the provision amounted to a warranty that they would not be delayed? (3.) The contracting officer required that additional excavated rock be placed in the dam and agreed to pay for rehandling of stockpiled material. Without protesting the resident engineer's refusal to pay for rehandling, the contractors delayed rock excavation until the material could be placed in the dam without stockpiling. Did they have a good claim for the resulting delay in doing their work? (4.) The contract authorized changed work. Was the Government liable for delay caused by its substitution of a single reinforced key wall for key trench and way?*

THE ANSWERS: No. Newhall - Herkner Construction Co. v. United States, 89 Fed. Supp. 321, decided by the United States Court of Claims.)

On question No. 3, the Court of Claims noted that the contractors waived any right to complain of delay caused by their failure to stockpile excavated materials when the Resident Engineer refused to pay for rehandling, because they failed to protest the refusal. The court also said that perhaps some of the delay complained of by the contractors was not chargeable against the Government because there was concurrent delay caused by the contractors' subcontractors.

Equipment Held to Be Subject to Sales Tax

THE PROBLEM: *An asphalt corporation was engaged in producing blacktop for sale and for use by it in performing paving contracts. It bought a mobile crane to move sand and slag from freight cars or stockpiles to bins in a portable asphalt plant. Was the purchase exempt from tax under a provision of the Ohio sales-tax act exempting chattels to be used "directly in the production of tangible personal property for sale by . . . processing"?*

THE ANSWER: No. (Tri-State Asphalt Corp. v. Glander, 90 N. E. 2d 366, decided by the Ohio Supreme Court.) The court said:

"As essential as instrumentalities of transportation are to the manufacture and processing of articles, those instrumentalities do not directly enter into the processing where they simply transport the ingredients used in the processing to the place where the process begins, or transport the finished products from their place of processing or manufacturing to their place of use."

Has a Right to Interest

THE PROBLEM: *When it is unsuccessfully asserted that a contractor abandoned a job and he proves that he quit justifiably because of misrepresentations as to the nature of work required, is he entitled to interest on the damages awarded him?*

THE ANSWER: Yes. (State v. Hartford Accident & Indemnity Co., 70 Atl. 2d 109, decided by the Connecticut Supreme Court of Errors.)

The court added that the fact that the contractor first claimed a larger sum as damages than was later agreed upon did not defeat his right to interest.

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West Canal Pushed Deeper Into Basin

Irrigation Ditch Pushes Past Ephrata, Wash., as Crews of Morrison-Knudsen Fight Unforeseen Rock Formation

✦ WEST CANAL, the irrigation ditch for 281,000 acres in the western part of Washington's Columbia Basin Project, is making rapid headway. In spite of 600,000 yards of rock that had not been foreseen, Morrison-Knudsen Co., Inc., has been pushing the canal past the town of Ephrata, and plans by the end of the 1950 season to hand the lining on 90,000 linear feet over to the U. S. Bureau of Reclamation.

M-K's $6,136,000 contract with the Bureau calls for excavation, canal lining, and 52 structures. The canal comprises two typical sections within M-K's contract limits. The first section is a 19-foot-deep ditch, with 38-foot bottom, 1½ to 1 slopes, and a 4½-inch plain-concrete lining. The second section is 18.7 feet deep, has a 30-foot bottom, and the same slopes and lining as the first section.

Major excavation quantities consisted of 1,350,000 cubic yards of rock and 2,500,000 cubic yards of common. One of the most heartbreaking problems was the presence, in the "common excavation" limits, of about 600,000 yards of cemented conglomerate and a calcareous, tight formation which is referred to somewhat loosely as caliche. This material all had to be drilled and shot.

C. & E. M. Photo

This blade used on the West Canal is called a "cow dozer" because it pulls dirt down to the Bucyrus-Erie 51-B dragline. It is sometimes used when the earth bank is left too full for the trimmer, but for the most part it works against the slope.

Three Excavation Spreads

West Canal, for approximately 50 per cent of its length, passes along a side-hill. The excavation pattern was therefore somewhat unique. On the one side there was a deep cut, while on the other side a compacted-core bank was built. This peculiarity almost automatically made for three spreads of excavation, as follows:

1. *Tractor Group:* Six Caterpillar D8's, with 16-yard Wooldridge Terra Clipper scrapers, made up the nucleus of this fleet. There were also two D8 push cats, two D8's with double-drum sheepsfoot rollers, and a permanent water line to complete the processing setup. The water line was laid from the town of Ephrata, about midway in the job, to both ends, and processing moisture was then applied by hose.

The function of the tractor fleet was to strip the initial overburden of diggable soil which lay over the rock line, and to make the compacted-core bank. Approximately 630,000 cubic yards of core-bank processing and construction was involved. For the most part the tractor-scraper hauls were short, usually within 500 feet.

The soil was mostly a fine, fluffy, volcanic ash, which made slick mud when it was too wet and fine dust when it was dry. It was not too difficult to handle, however, and when the moisture was applied by hose it took but little processing with a disk to distribute it uniformly. Eight roller passes developed the necessary 95 per cent modified AASHO density.

Core-bank construction by this spread finished the embankment approximately 6 inches full beyond the neat line, to give the trimmer something to work with later on.

2. *Dragline Operation:* Since the scrapers could not economically be worked right down to the solid-rock line, there remained a small amount of layered and pocketed earth and gravel just above rock. The removal of this material was the assignment of a 2-yard Bucyrus-Erie 51-B dragline. The machine cast to one side, and if necessary a D8 and dozer helped to move the earth to one side.

3. *Drilling, Dynamite, and Digging:* This was the main excavation spread. It consisted of drilling equipment, blast-

(*Continued on next page*)

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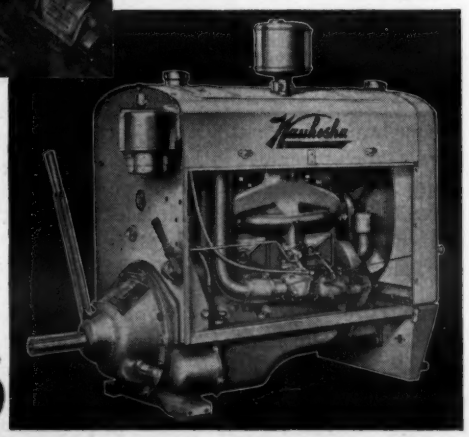

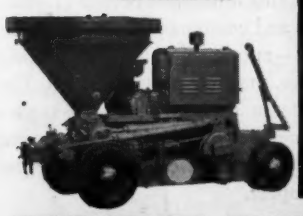

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ing crews, Bucyrus-Monighan and Marion excavation draglines, and a Bucyrus-Erie 54-B finish dragline. This was a high-capacity outfit. For example, the Monighan alone dug 80,000 cubic yards in a week.

Drilling was done on a 2-shift basis, by 6 to 12 Ingersoll-Rand wagon drills. Timken steel in lengths up to 30 feet was used to get the canal prism to grade. Some Timken rock bits were used, but for the most part the basalt in rock sections was hard and tough enough to call for tungsten-carbide bits. Timken as well as Ingersoll-Rand's Carset bits of this design were used, and the drillers reported footages of 600 to 700 feet per bit. Holes were put down on a grid pattern, with spacings of 10 to 12 feet, depending on the formation. They were not sprung. Column loading, with about 3 feet of stemming over the powder on the deep holes, was the rule. Approximately ⅓ pound of Atlas 40 per cent Flo-Dyn per cubic yard broke up the rock so the draglines could dig it.

In heavy rock cuts, extending from the bottom floor to the top of the canal, the blasted material was removed by a 200-W Bucyrus-Monighan, swinging a 7-yard Esco bucket from a 125-foot boom. Two passes were necessary in the deepest cuts, and because the machine had to be able to reach its disposal area, careful spotting had to be observed. The machine made its first pass from a digging road on top of the formation directly over the 16-foot inspection berm. As it dug this pass, it removed the top half of the canal prism, but broke off to leave in the yardage on which the machine was resting.

On its second pass, the machine then removed the remainder of the canal prism to a point close to grade, and at the same time it removed the material over which it had previously operated.

In sections where the rock line was below the top of the canal, a Marion 111-M dragline with a 100-foot boom and 4½-yard Esco bucket removed the broken rock. This was a crawler-mounted machine, while the Monighan was a walking dragline.

Disposal methods were very much the same for both machines. The material was cast to form a neat spoil bank on either side of the canal.

If both of these large draglines had tried to finish the excavation prism to neat lines, they would of course soon have been working below their capacity. Therefore they merely roughed out the canal, and when they got close enough to grade where they could no longer scoop out full buckets, they moved on, leaving final excavation to a Bucyrus-Erie 54-B dragline. This was a 2½-yard machine. It could work practically at capacity and still trim the excavation to a neat line about 6 inches low. Columbia Basin canal specifications now require all rock sections to be undercut and backfilled with earth.

In the sections where cemented conglomerate and caliche appeared in the common excavation, both the Monighan and the Marion had a rough time. For quite a few shifts the rigs attempted to dig without blasting, but it was useless. From then on the unforeseen formations were drilled and jarred loose before the machines got to work. It was of immeasurable help to weld two large ripper teeth to the back end of the Monighan's digging bucket. As the bucket loaded, it naturally got heavier and forced the teeth down into the formation, giving a much-desired ripping action to help in the succeeding passes.

The Monighan and Marion worked six 24-hour days per week, with over 90 per cent effective operating time. Tractor-scraper work, and drilling, were both on a double 8-hour-shift basis, 6 days a week.

Routine fueling, lubrication, and service for all units were done in the field, as were most operating repairs. Occasional breakdowns involving large-scale mechanical work were remedied by hauling the equipment in to the M-K headquarters yard and shops, about a mile west of Ephrata.

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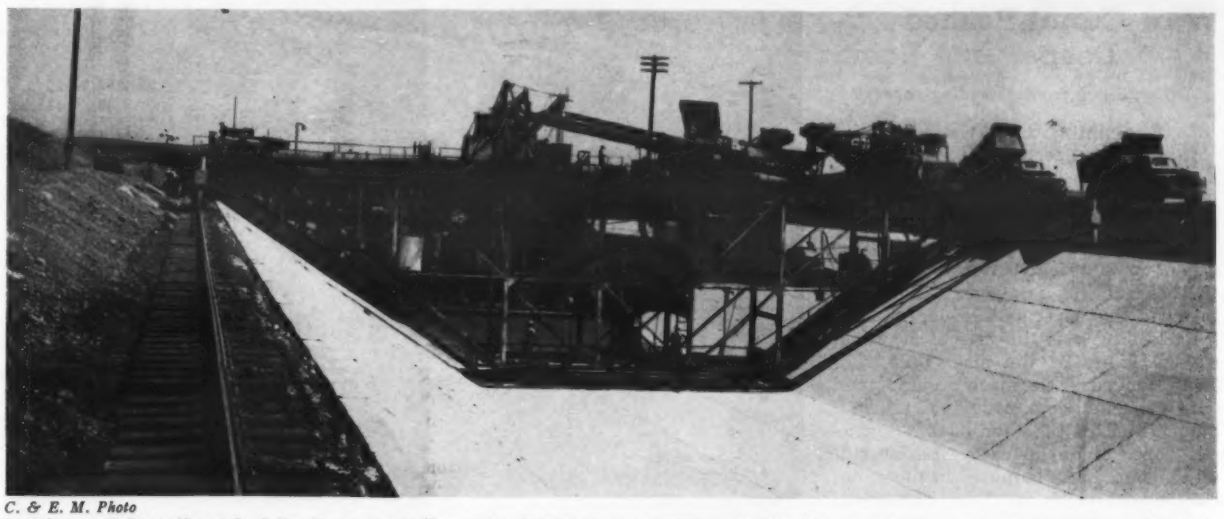
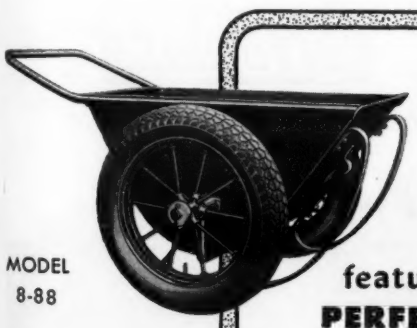


C. & E. M. Photo

Looking east from the end of the line, we see the curing bridge in the foreground with the remainder of the lining equipment behind.



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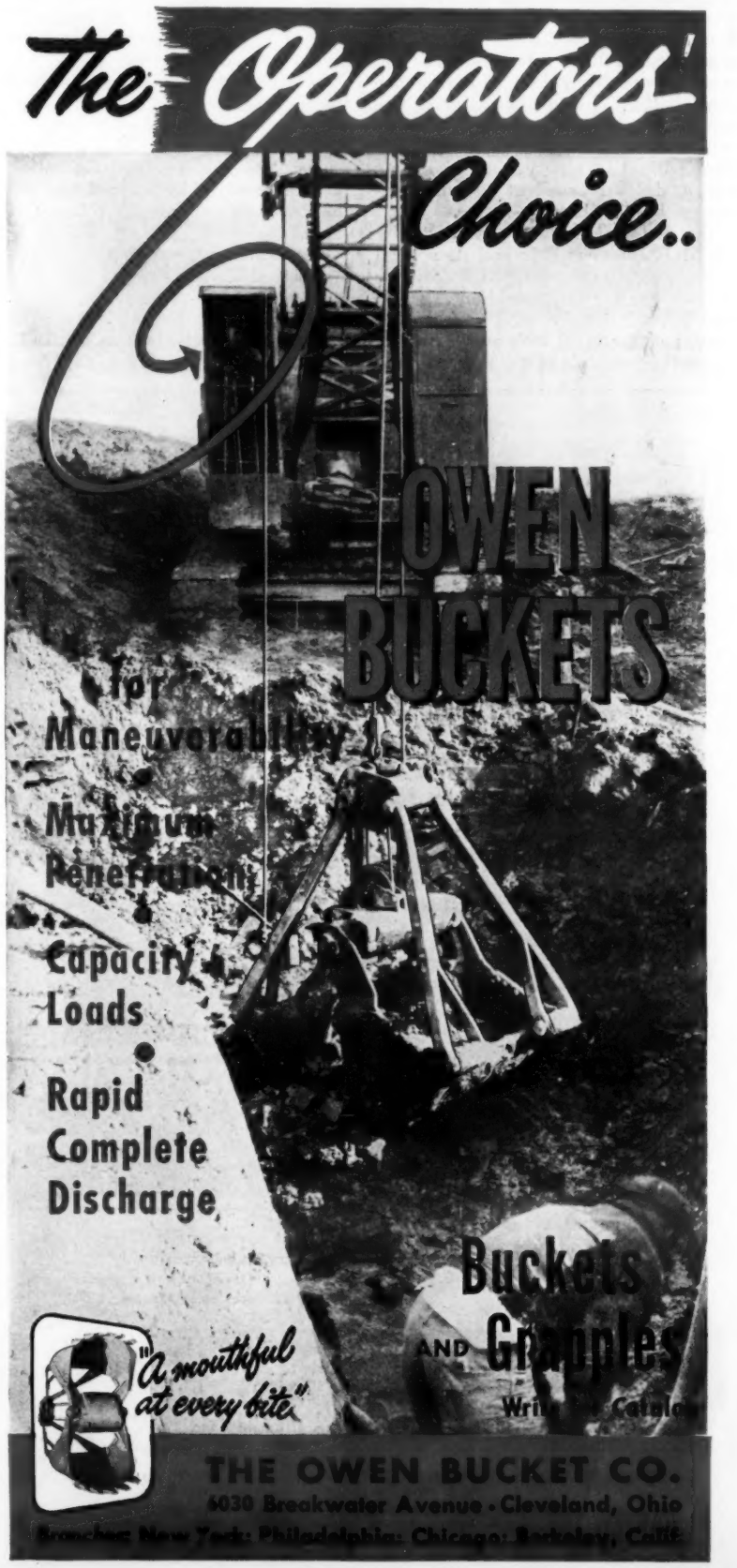

West Canal Pushed Deeper Into Basin

(*Continued from preceding page*)

Backfilling and Trimming

In all rock sections, including the location where cemented conglomerate and caliche were found, the canal was undercut 6 inches and then backfilled with 9 inches of compacted earth. This was done to obtain better accuracy for the base of the lining, and in general to speed the work and reduce its cost.

Backfilling was the role of a special rig, made up of the main unit of a 51-B Bucyrus-Erie machine, equipped with a special boom made by Gunnert & Zimmerman of Stockton, Calif. A special dozer blade, to carry the backfill up the slope, was mounted in the boom framework, which paralleled the 1½ to 1 canal slope when the boom was in working position.

Backfill material was hauled in by 5 end-dump Euclids, hauling from two locations. Some of the loads came from the trimmer, farther ahead in the canal. The remainder came from a borrow pit, where a 331-M Marion and a Bucyrus-Erie 15-B dragline did the loading. The Euclids came down into the canal from access ramps. They dumped first on the canal bottom, where the material was spread by a D8 and its dozer. The large rubber tires of the hauling units, coupled with the pressure of the D8's tracks, did an excellent job of compaction on this bottom course.

The canal sides were backfilled by the 51-B Bucyrus-Erie and its special boom. The Euclids dumped at the toe of the slope for this operation. The D8 then shoved the dirt part way up the slope, and the 51-B took over. Operating on the principle of a mine scoop, the blade traveled up the slope and dropped an even load of dirt. If water was needed, it was sprayed on during the leveling operation.

A Northwest Model 6 then followed the leveling blade. It handled a Hyster Grid Roller, ballasted so it would deliver the required density in about 8 passes. The Model 6 held the roller in position laterally by its load line, while the drag cable pulled the roller up the slope.

The trimming machine which then followed these units was a 140-ton rig, with a 108-foot wheelbase and two 16-inch endless bucket lines. These lines overlap at the bottom center line. Main driving power for the bucket lines came from D7 Caterpillars, arranged so their final drives hooked direct into the gear train of the bucket lines.

The trimmer is an improved replica of many such machines now used on irrigation work. One of the improvements consists of General Electric variable-speed drive motors at each set of wheels. The use of variable-speed motors improved the performance of these ponderous rigs immensely as they went around the curves. Excess material from the trimmer usually went direct to Euclids, which hauled it back for re-use.

C. & E. M. Photo
Cement cars are unloaded at the dual Noble batch-plant setup on a spur siding from the Great Northern tracks.

Concrete

Heavy batching capacity had to be provided to deliver up to 227.5 cubic yards an hour used at the placing point. M-K used two Noble full-automatic 150-ton batchers in a side-by-side setup. Two batch trucks could be loaded at once. The plant was on a spur siding from the Great Northern tracks.

(*Concluded on next page*)

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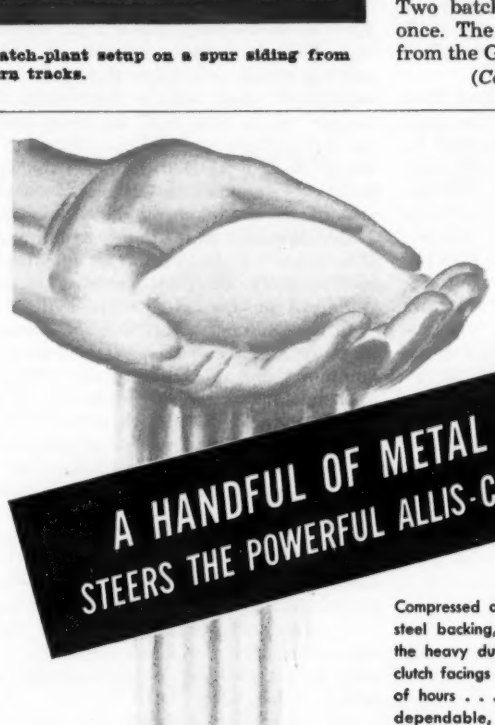

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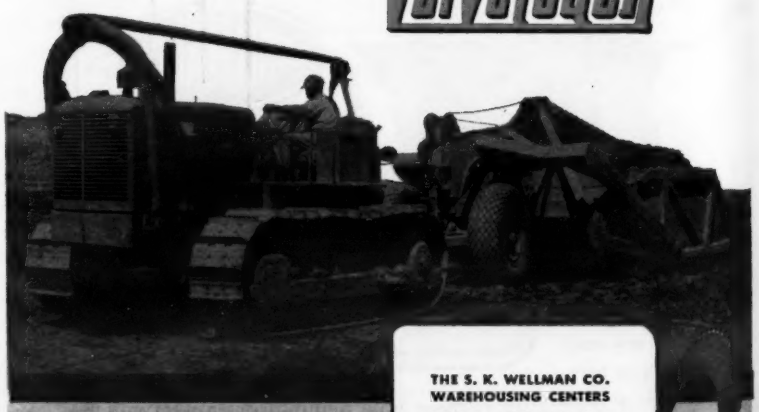

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Nelson Construction Co. of Ephrata supplied concrete aggregates from a nearby crushing setup, and the trucking firm of Bratton Griffin did the hauling. The materials were stored over a 9-foot recovery tunnel, with a 30-inch delivery conveyor. A re-screening bunker, with Vibro King decks, sized the material before its delivery to the batchers.

So far as bulk cement was concerned, it came in by railroad from Washington and Montana plants. Both Noble plants had 500-barrel batching silos, and in addition there was a shop-made 3,000-barrel storage silo which fed into the Noble plants. An air tugger was used to handle the cars as they were unloaded, and the railroad spur was big enough to hold 16 empties and 16 full cars. Two D8's worked around the plant, mostly in the aggregate stockpiles.

Dry batches were delivered out to the job by Bratton Griffin's trucks, and were dumped to the skips of two Koehring 34-E Twinbatch pavers. Mixing water and Protex air-entraining agent were added at the pavers. Each machine then discharged direct to a 36-inch conveyor line, which carried the fresh concrete up to a common hopper. These conveyors were driven by electric motors, and operated at 300 fpm to carry the concrete away rapidly.

From the hopper, a 36-inch conveyor led to the deck hopper of the 160-ton slip-form liner, which rode along on railroad rails at the top berm of the canal. This huge machine, incidentally, was moved bodily twice during the job. Condick Co. of Berkeley, Calif., had trailers that would handle such a load and men with the know-how to jack the machine up, turn it, and load it to the trailer. Morrison-Knudsen Company, Inc., originated the idea of such heavy moves, rather than dismantling the machines, on its reclamation work in California.

Two electric-powered cars on the slip form distributed concrete to 25 downspouts, which led to the distribution chamber at the placing point. A heavy Clyde Wood & Zimmerman patented tube vibrator in this distribution chamber forced the concrete out the bottom of the slip form like toothpaste out of a tube. A sheet-metal plane, carried on a spring-tension frame behind the machine, dragged on the float finish formerly done by cement finishers. M-K used only 16 cement finishers, and they were busy most of the time dressing joints.

The sides and bottom of the canal got a total of 8 longitudinal contraction joints, while transverse joints were cut every 14 feet. A knife on a traveling jumbo cut the transverse cracks. Knives on the slip-form frame cut the longitudinal cracks. Mastic joint filler was applied by air pressure to fill these cracks, and a final pass was then made by the jumbo to apply a coating of white-pigmented Sure-Cure. Lyons & Lyons of Los Angeles had the curing subcontract.

The highly efficient slip form also had variable-speed motors to help it around the curves. Highway contractors are sometimes astounded to learn that despite the difficulty of laying rails and placing the concrete against a 1½ to 1 sloping surface, in one 9½-hour shift this crew placed the equivalent of 3,274 linear feet of 24-foot concrete highway. And that highway would be thicker than most states now build.

Structures were built by Cherf Bros., Ephrata, under a subcontract.

A Major Undertaking

The 88-mile West Canal, when completed some contracts hence, will be a major part of the Columbia Basin work.

It will wind along near the northern and western boundaries of the project for about 50 air-line miles, passing near the towns of Soap Lake, Ephrata, and Quincy. A 9,150-foot tunnel will carry it through the Frenchman Hills to Royal Slope, where it will branch to the east and west. The first 6½ miles was finished in 1949 by Winston Brothers Company and Utah Construction Co. The job included two siphons over a mile long, which with Soap Lake Siphon rate as the largest in the Northwest.

Morrison-Knudsen's recent job was one of three now under way on West Canal. A 14.5-mile section, from Winchester Wasteway to a point 7 miles southwest of Quincy, is being done by Marshall, Haas & Royce, Haas & Rothschild of Belmont, Calif. The canal will be 60 feet wide through this section, and will not be lined.

Also under construction is the south end of the third section. It is a reinforced steel and concrete flume or chute, 5,200 feet long, varying from 14 to 18 feet wide. It will drop the canal grade 70 feet. Minnis & Schilling, from Eugene, Oreg., has this job.

Personnel

The USBR chain of command on M-K's project started with Chief Engineed L. N. McClellan, and at field level ended with Resident Engineer P. M. Noble.

For M-K, there was a group of oldtimers with a few newcomers to the "Emkayan" fold. Project Manager Roy Johnson had general charge. T. W. Barber was Project Engineer. Lining Superintendents were Bud Hall and George Adair. Excavation was under the joint supervision of Bill Huff and Art Sorrels. Lee Ellis was Master Mechanic, Bill Porter was in charge of the batch plant, and the office manager was Frank Morrison.

for low-cost, record-breaking performance

it's the McCARTHY SELF-PROPELLED HORIZONTAL DRILL

• The self-propelled McCarthy makes blast holes close to the floor or bottom and it makes them fast!

Actual records show that for operations in shale, sandrock and soft limestone overburdens, these tough, mobile power units easily drill up to 1500 feet per day.

Operators like the compact McCarthy design . . . ideal for working confined areas. They like the four special, individual leveling jacks that make setups easier, and the smooth, steady way the hydraulic carriage moves forward, feeding 4, 6 and 8-inch diameter auger sections into the earth to depths of 100 feet or more.

Write today for the complete story on McCarthy Drills. There's bigger money waiting for you and McCarthy knows how you can get it faster. List of users on request.

DRILLING EQUIPMENT SINCE 1901

SALEM

THE SALEM TOOL CO.

769 SOUTH ELLSWORTH AVE. • SALEM, OHIO

Less Bucket Weight
.... More Pay Load!
Unnecessary weight has been eliminated and a bigger payload built in. Just one reason why Omaha Dragline Buckets are used from coast to coast, from border to border by successful contractors. Available in four types. Write today for catalog giving complete description and specifications.
OMAHA
DRAGLINE BUCKETS

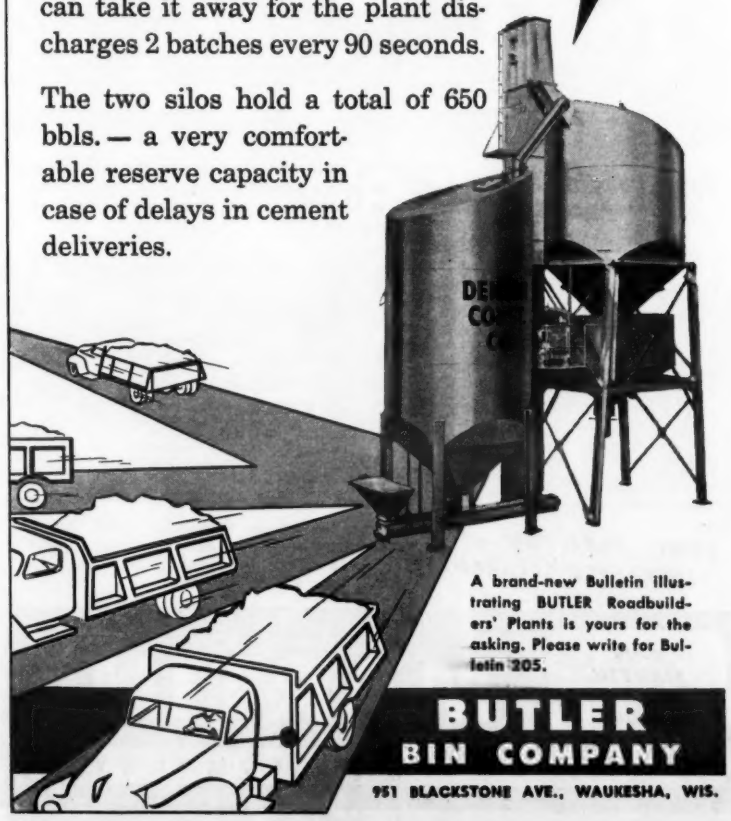
DRAKE-WILLIAMS-MOUNT • OMAHA, NEBR.

TRUCKS never WAIT AT THIS

BUTLER Batching Plant

Here's ample production in cement batching to keep up with a dual drum paver plus a 27E. Actually batching is faster than the trucks can take it away for the plant discharges 2 batches every 90 seconds.

The two silos hold a total of 650 bbls. — a very comfortable reserve capacity in case of delays in cement deliveries.



A brand-new Bulletin illustrating BUTLER Roadbuilders' Plants is yours for the asking. Please write for Bulletin 205.

BUTLER BIN COMPANY

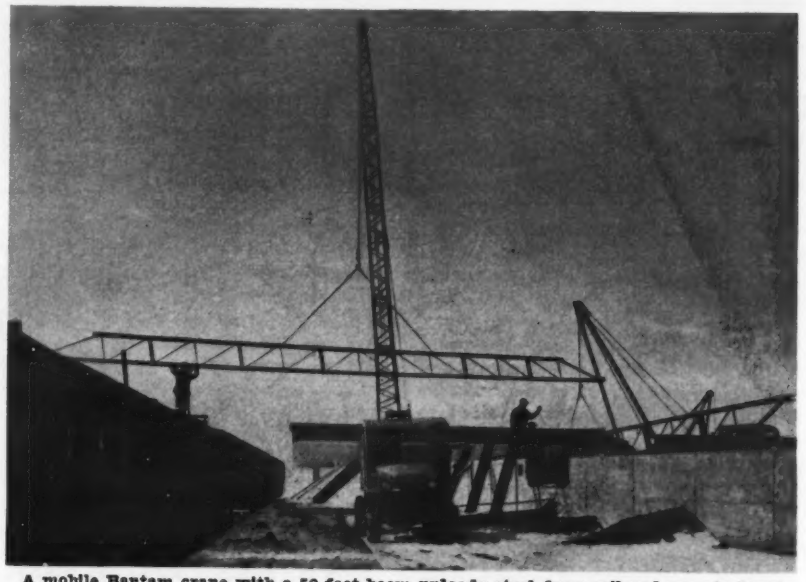
951 BLACKSTONE AVE., WAUKESHA, WIS.

Sectional Cabinets For Filing Drawings

Sectional steel filing cabinets for blueprints, maps, drawings, tracings, etc. are made by the Stacor Equipment Corp., 1887 Atlantic Ave., Brooklyn 33, N. Y. They may be obtained in 5-drawer or 3-drawer units; inside drawer sizes are 37 x 26, 43 x 32, or 50 x 38, with special sizes available on request. A single cabinet base may be used regardless of the number of sections stacked, according to the manufacturer.

The Stacor Planmaster file is built of heavy-gage welded steel. Drawers roll smoothly on case-hardened ball-bearing rollers, according to the company, and will not pull out accidentally. The unit is said to be precision-built with all individual sections interlocking. It is finished in grey or green hard-baked enamel.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 15.



A mobile Bantam crane with a 50-foot boom unloads steel from railroad cars to boom trucks at the rate of one 40,000-pound car in 2½ hours, during the construction of the new Marshall Wells Co. warehouse in Billings, Mont.

High-Tensile-Steel Welds

A booklet on "The ABC's of Welding High-Tensile Steels" has been issued by Arcos Corp., 1500 S. 50th St., Philadelphia 43, Pa.

The booklet explains the importance and effectiveness of low-hydrogen electrodes in welding low-alloy high-tensile steels, mild steel under highly restrained conditions, and sulfur-bearing free-machining steels. In the past, it says, steel producers have often recommended mild-steel electrodes for these classes of welding; but new Arcos Tensilend series eliminates preheating and underbead cracking.

In simple question and answer form, the booklet compares mild-steel and low-hydrogen electrodes as to preheating, underbead cracking, moisture in the arc and in the coating, burn-off rate, cost of operation, applications, and stress-relieving of the weldments.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 22.

Another Record for MARTIN "FOLDING GOOSENECK" Trailers!

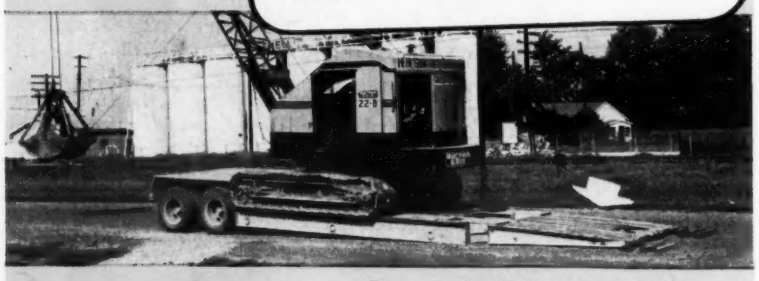
Illinois Contractor Gene Gunther says, "Safety—not speed—is the most important loading-unloading factor. There is absolutely no possibility of losing a machine with the Martin Trailer."

¾-yd. Crane Loaded and Rolling —Regularly—in 5 Minutes!

• Ask the H. H. Gunther Construction Co. of Galesburg, Illinois, about Martin "Folding Gooseneck" advantages! From owner to truck driver, the company is enthusiastic over the trailer's record performance!

They say, "By actual time tests, we *regularly* load a 3/4-yd. crane *in five minutes* . . . from trailer arrival to when it moves out!"

This is the speedy performance that cuts hauling time and costs — increases equipment working time. This is the performance your Martin-"Caterpillar" Dealer can tell you more about — can show you how it can save for you . . . see him today!



FORMS ITS OWN RUGGED RAMP!

The easily-detached gooseneck folds down to form a perfect loading ramp. No cribbing or blocking needed. Any machine can walk right on.

LOWER PLATFORM— INCREASED CLEARANCE!

One man does the work. Truck power quickly takes up the neck and takes off with the load on large, easier rolling tires. Low bed gives greater clearance.

YOUR MARTIN DEALER IS YOUR "CATERPILLAR" DEALER!

MARTIN MACHINE COMPANY

Truck Cranes Erect Steel For Warehouse

To speed erection of steel columns, roof trusses, and other structural parts on Marshall Wells Co.'s new warehouse in Billings, Mont., Hakes Erection Co. brought in two 5-ton Schield Bantam cranes, truck-mounted. One Bantam with a 50-foot boom, belonging to Hakes, unloaded cars from a nearby siding, while two boom cranes spotted steel throughout the building area. Another 35-foot-boom Bantam rented from another contractor did all the erecting. This combination unloaded 40,000-pound railroad cars in an average 2½ hours each and placed 1,034,000 pounds of steel in all.

During delays between steel shipments, the Bantams moved around town and kept busy on other scattered erection jobs in the area.

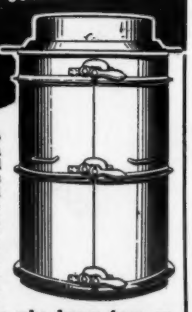
Cahill-Mooney Construction Co. of Billings was general contractor on the job.

M-C & S Wins Award

The 1949 annual report of the Merritt-Chapman & Scott Corp. was given first place in the construction division by the judges of the Financial World Survey of Annual Reports. The firm was presented with a bronze "Oscar of Industry" trophy at the Annual Awards Banquet in New York City on October 30.

Morrison-Knudsen Co. was runner-up for top honors in the construction division and the Lane-Wells Co. was in third place.

THE "Quinn Standard" FOR CONCRETE PIPE



The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

Quinn Heavy Duty Pipe Forms

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

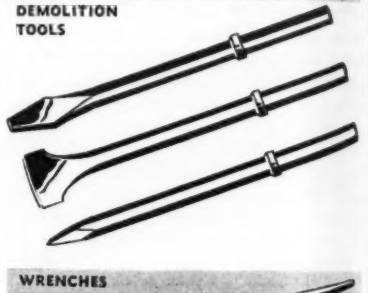
WRITE TODAY. Complete information, prices, and estimates sent on request. Also manufacturers

QUINN CONCRETE PIPE MACHINES

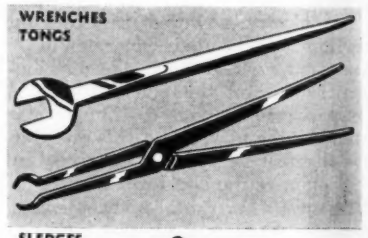
QUINN WIRE & IRON WORKS 1045-21ST BOONE IA

STRUCTO LINE OF CONTRACTORS TOOLS

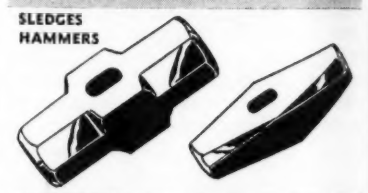
DEMOLITION TOOLS



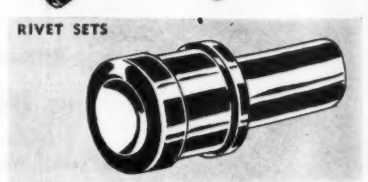
WRENCHES TONGS



SLEDGES HAMMERS

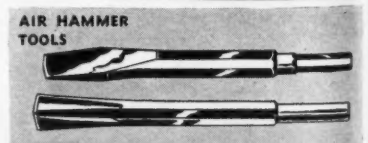


RIVET SETS



DRIFT PINS

AIR HAMMER TOOLS



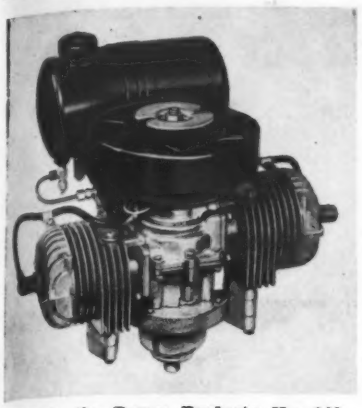
ALL STRUCTO tools are made in the Arrow shops by skilled tool makers.

Only the finest quality steel is used, and every STRUCTO tool is backed by 36 years experience in making fine tools.

Write for Bulletin No. 75 showing the complete line.

ARROW TOOLS INC.

1900 South Kostner Ave., Chicago 23, Ill.



This is the Power Products No. 360 vertical twin-cylinder, 2-hp. engine.

2-Hp Gasoline Engine

A new 2-hp gasoline engine specifically designed for light weight has been announced by Power Products Corp., Grafton, Wis. The Model 360 is a vertical twin-cylinder type in lightweight aluminum, primarily for use on rotary-type power mowers of blade-diameter sizes up to 21 inches. It can be adapted for other applications requiring vertical shaft drives, the company says.

The engine features trouble-free mist-type lubrication and simple mounting, Power Products claims. Adaptor mounting flanges which incorporate a third bearing arrangement are available. Also offered is a special flange with mounting bolt holes on an 8-inch circle to allow for interchangeability in the field with competitive engines using this size of mounting flange. The engine can also be used in conjunction with the NEMA adaptor flange, previously announced by Power Products Corp., which provides for interchangeability with direct-connected electric motors on frame sizes 43 to 49.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 67.

Sickle-Bar Grinder

An electric tool and sickle grinder equipped with a long heavy-duty sickle holder has been developed by the Wissota Mfg. Co., 1301 S. Third St., Minneapolis 4, Minn. The company points out that with a long holder the grinder can completely sharpen 5-foot sickles without reclamping and 7-foot sickle bars with only one reclamping. The unit is made of heavy steel and has two holding clamps. It may be used for sharpening sickles, scythes, machettes, and other cutting tools.

The design of the electric grinder enables awkward grinding jobs to be done easily, Wissota says. The grinding wheels project in front of the frame and therefore there is no interference and the wheels can be worn down to the flanges. The grinders are equipped with fully vitrified abrasive wheels. A shielded heavy-duty ⅓-hp motor is set back and away from the abrasive wheels on a one-piece frame.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 48.

Bearings Plant Expands

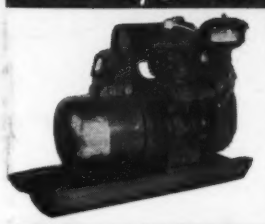
SKF Industries, Inc., is expanding its Philadelphia plant. Construction of an addition which will provide more than 40,000 square feet of floor space was begun in October and will be finished in five or six months. The addition will be fully equipped and in use by the middle of 1951.

ASTM Cement Standards

The tenth edition of "ASTM Standards on Cement," sponsored by Committee C-1 on Cement, of the American Society for Testing Materials, is now available. It presents in convenient form the various ASTM standard and tentative specifications on cement, methods of chemical analysis, and methods of physical testing. Additional material in the appendices includes information on analytical balances and weights, a manual of cement testing, and a list of selected references on portland cement. This edition also contains an article on "The Principle of the Methoxyl Method for Determining Vinsol Resin in Portland Cement."

Copies of this 224-page book may be obtained from the ASTM, 1916 Race St., Philadelphia, 3, Pa. The price is $2.00.

SAVE 1/3 ON PORTABLE ELECTRIC PLANTS



New Winpower Portable Plants, powered with heavy-duty Wisconsin engines save you approximately ⅓ on purchase price. Especially designed for contractor use, with full range of sizes, 300 to 10,000 watts. Quality built for 25 years—famous for long, dependable service. Write today for free literature and prices.

WINPOWER MANUFACTURING CO. — Newton, Iowa

WHEN BUYING A VIBRATOR

It Pays to Insist on a JACKSON

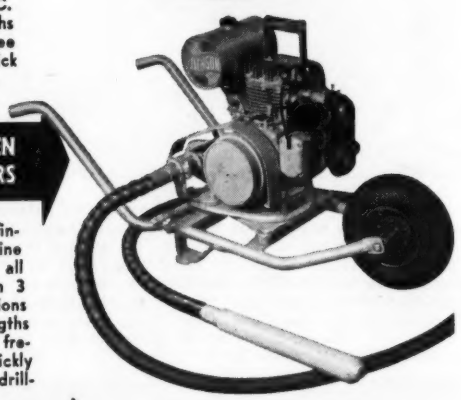
Jackson vibrators are the products of more than 27 years of specialization in this field, and are offered in a wide range of models to give you the vibrator that exactly suits your particular needs on every type of construction . . . the one that will give you the greatest savings in time, labor and money; plus UNMATCHED DEPENDABILITY.

FOR GENERAL CONSTRUCTION

THE POWERFUL, Handy JACKSON ELECTRIC

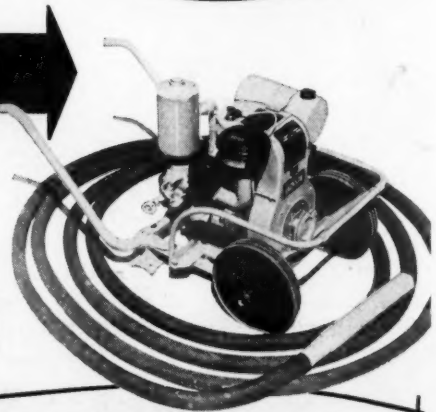
2½ HP Motor. Powerful enough to handle the stiffest mixes with maximum length of shaft (28'). Operates from light-socket; 115 volt, single phase AC or DC. 8,000 to 10,000 VPM. Weighs only 50 lbs. Available with three vibrator heads for thin or thick sections. Model No. FS-150A.

THE ACE OF ENGINE-DRIVEN FLEXIBLE-SHAFT VIBRATORS



Proved on countless jobs the finest of its class. 4.7 HP engine — plenty of power under all conditions. Available with 3 heads for thick or thin sections and shafting in 7' and 14' lengths up to 28'. Instantly variable frequency up to 7500 VPM. Quickly converted to grinding and drilling. Model FS-6A.

THE HYDRAULIC with the TIME-SAVING 50' REACH



the hard-to-reach spots are easily accessible with this machine and much time is saved by eliminating changes of power unit location. All moving parts run in oil under pressure—no maintenance required. 7 HP engine and 2¾" head assures perfect compaction under most severe conditions. 4,000 to 7,000 VPM — instantly variable. The finest vibrator of its type money will buy.

FOR EVERY PHASE OF CONCRETE VIBRATION

from thin sections to mass construction and paving you will find the ideal Jackson Vibrator FOR SALE or FOR RENT at your Jackson Distributor. Write for your free copy of the "POCKET GUIDE" describing the complete line.

ELECTRIC TAMPER & EQUIPMENT COMPANY
LUDINGTON, MICHIGAN

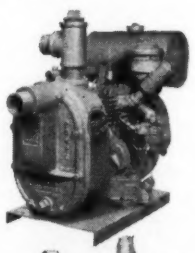
Marlow Pumps

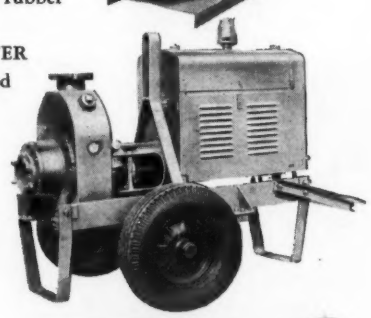
. . . sign of good pumping on construction jobs.

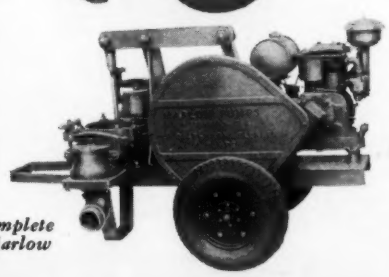
MARLOW MAKES THE WORLD'S MOST COMPLETE LINE OF CONSTRUCTION PUMPS

MARLOW MAKES BOTH TYPES . . . self-priming centrifugal and diaphragm . . . MARLOW MAKES THE LARGEST SIZE RANGE . . . 1½ to 10 inch, 3,000 to 240,000 GPH for the Water Wizard Self Priming Centrifugals. And for the Mud Hog Diaphragm Pumps — 3 and 4 inch single and 4 inch double, capacities to 9,000 gallons per hour. Steel wheel, rubber tire or flat-base mounted.

MARLOW OFFERS THE WIDEST POWER CHOICE . . . Gasoline or Diesel, air-cooled or water-cooled. Electric-driven. Belt-driven. PLUS EXCLUSIVE MARLOW FEATURES . . . In the centrifugals; fast, automatic, trouble-free priming and repriming, by the exclusive diffuser method. In the diaphragm pumps: patented non-clogging valves. And other exclusive features.







Wherever pump users gather you will hear the name MARLOW used as a standard of pump efficiency, trouble-freedom and long life. It will pay you, too, to standardize on the standard.

Write the Marlow factory for complete information and the name of the Marlow dealer nearest you.

MARLOW PUMPS
555 GREENWOOD AVENUE
RIDGEWOOD, NEW JERSEY
MANUFACTURERS OF QUALITY PUMPS SINCE 1924

C. & E. M. Photos

Without a song? Never the New England-AEDers at their regional meeting. Looking on from the head table at the Boston University Club (above, left to right) are Guy Berger of H. O. Penn Co., Newington, Conn.; Clint Halladay, national AED President; Howard Noble of Noble-Belisle Co., West Lebanon, N.H.; and Jack Gorman of Tractors, Inc., Providence, R.I.

Distributor Doings

AED Region 2 Members Get Together At the Baltusrol Golf Club in N. J.

The boys of Region 2 of the Associated Equipment Distributors, New York and New Jersey area, got together at the Baltusrol Golf Club in Springfield, N. J., September 27, at a meeting called by Harry Hush of Griffin Equipment Corp., Regional Director and Vice President of AED. The late Bill Bucher of R. E. Brooks Co., Past-President of AED, arranged for the club facilities. Earlybirds were there for lunch and a follow-up on the Baltusrol links. Good weather and a fine green contributed to low scores, but the exact tally is being kept secret for reasons of "military security".

Back at the clubhouse talk shifted from pars and birdies to priorities, allocations, and delivery dates. All were pleased, though, with the fine selling season enjoyed this year. Paul M. Troast, Chairman of the New Jersey Turnpike Authority, guest speaker for the evening, pointed out just how much the New Jersey Turnpike helped. "There's over $36,000,000 worth of construction equipment working on the 118-mile strip of superhighway", he told the members at dinner.

About 50 members of AED turned out for the affair, which pulled men all the way from the Dakotas—Clint Halladay of Halladay-Dettman Co., Sioux Falls, S. Dak., President of AED, and Stan Laskey of Northwest Equipment Co. Clint made the Region 2 meeting a part of his cross-country hop getting around to seeing everyone. Boston, for the New England distributor meeting, was his next stop. Frank Fitzpatrick of Parker-Danner Co., Chairman of the Convention Committee, and William A. Danner of the same company, Past-President of AED, were also on hand.

Paul Troast's talk was the highlight of the evening. Toll-road financing was the topic, but with plenty of data on equipment use. Mr. Troast said that of the $36,144,970 worth of equipment on the New Jersey Turnpike job, "$4,171,-200 worth were bulldozers, $5,152,000 cranes, $302,300 graders, $68,000 pavers, $320,300 rollers, $371,900 compressors, $7,239,300 trucks, and $438,100 for pier construction equipment. The remainder was listed as $10,400,000 worth of diversified equipment for fill operations, $581,700 miscellaneous, and $2,376,000 for Section 4 of the Turnpike for which there is no equipment breakdown."

Mr. Troast explained that of the $220,000,000 total cost of the project, $140,000,000 would go for construction. The remainder would be used for right-of-way purchase, interest, administration, purchase of roads on the line, etc. He explained the reasons for establishing a turnpike authority in New Jersey and the workings of the organization, pointing out that it employs only 73 persons. Mr. Troast outlined the basis of revenue bond financing for the project and stated that "this job has shown that toll highways can be privately financed with risk capital solely on the basis of engineering reports". These reports predict full payment for the project in 24 years with a probable return of $20,000,000 a year for the remaining 11 years of the life of the bonds. The AED boys didn't get a final answer to one of the points they still had on their minds, though. "Will the pavement be rigid or flexible?" That is yet to be decided, Mr. Troast said.

After the fine talk and a hearty meal most of the members retired to the club's television room to see the Louis-Charles match. E. H. "Red" Kliebenstein took a little loss on his 8-to-5 open offer earlier in the evening. But he wasn't the only one to figure Louis to win. Was he?

(Continued on next page)

C. & E. M. Photo

C&E Monthly Publisher Donald Buttenheim (standing) talks to Mattheis of Hedge & Mattheis, while Bill Danner of Parker-Danner enjoys an after-dinner cigar.

C. & E. M. Photo

Roll call at the AED Region 2 meeting, at the Baltusrol Golf Club in Springfield, N.J., was gay. There could be no hint, of course, that Bill Bucher (far left) of R. E. Brooks Co., Past-President of AED, was to die a week later. Next to Bill is Stan Laskey of Northwest Equipment Co., Fargo, N. Dak.; Paul M. Troast, Chairman of the New Jersey Turnpike Authority; Clint Halladay of Halladay-Dettman Co., Sioux Falls, S. Dak., President of the AED; Bill Danner of Parker-Danner Co.; Red Kliebenstein of E. H. Kliebenstein Co., Inc., Ridgefield Park, N.J., and Harry Hush of Griffin Equipment Corp., Regional Director and Vice President of the AED.

C. & E. M. Photo

The talk in New Jersey was of pars and birdies, the Louis-Charles fight—and priorities, allocations, and delivery dates.

New England Dealers Talk Shop In Boston: Clint Halladay There

The fall meeting of the New England group of Associated Equipment Distributors held in Boston late in September was well attended and marked by spirited discussion. Among those present was Clint Halladay, national President of AED, who made the journey to the east coast all the way from Sioux Falls, S. Dak., as part of a swing around the circuit to keep in touch with those men and firms supplying the tools for the country's construction program. At home, Halladay heads the firm of Halladay-Dettman Co., which has been selling and servicing equipment for the past 22 years.

While no key major speeches were given, there was no dearth of talk, as practically all present had their say on current problems. A well coordinated afternoon program was followed by a cocktail party, dinner, and entertainment. Guy Berger of H. O. Penn Machinery Co., Inc., of Newington, Conn., is President of the New England Equipment Distributors Association. T. B. Holmes, Jr., of Holmes-Talcott Co., Hartford, Conn., is Secretary-Treasury. And Howard Noble of Noble-Belisle Co., West Lebanon, N. H., is AED Director for Region 1.

Winchester Back With AED

Carol F. Winchester, former Executive Secretary of the Associated Equipment Distributors, has been appointed AED Washington contact representative and observer. In his new capacity, he will serve as a liaison with key governmental agencies and will work closely with them on matters affecting the interests of distributor members. He will continue to head his own business as an equipment-manufacturer representative in the capital.

Bucher of Brooks Co. Dies

William W. Bucher, President of the R. E. Brooks Co., New York distributor, died October 3 in his home at Summit, N. J. He started as a bookkeeper with Abbey Brooks & Co., in 1911, and was elected President of the Brooks firm in 1926. In 1949 he was President of the Associated Equipment Distributors of America.

Just a week before he died, Mr. Bucher had taken part in a meeting of Region 2 of the AED and secured the facilities of the Baltusrol Golf Club for the meeting (see page 90).

Three New Dealers for Koehring

The Koehring Co., Milwaukee, Wis., has appointed three new distributors. In South Dakota, Sioux Road Equipment, Inc., with offices in Sioux Falls, Aberdeen, and Rapid City, succeeds Empire Equipment. The firm will represent the C. S. Johnson Co. and the Parsons Co. in addition to Koehring.

In the west Texas territory, Tom W. Carpenter Co., Inc., of Amarillo, is replacing Goodman Bros., Inc. The new distributor will handle Koehring and its subsidiaries the Kwik-Mix Co., the C. S. Johnson Co., and the Parsons Co. Koehring, Parsons, and Kwik-Mix equipment is now sold and serviced in Alabama and northwest Florida by the Construction Equipment Co. of Birmingham, Ala.

Correction, Please

Our September (page 84) announcement that A. E. Briggen had been made Treasurer and General Manager of D. D. Kennedy, Inc., should have read "Assistant General Manager". Sorry.

For Huber in Ohio

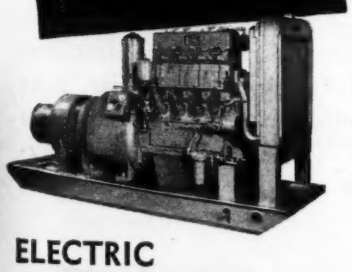
Construction Machinery & Supply Co., Inc., 128 St. Clair St., Toledo, Ohio, is now handling the road-building and maintenance equipment made by the Huber Mfg. Co., in 17 northwestern Ohio counties. W. L. Gibson is President of this 12-year-old equipment firm.

(Concluded on next page)

The treads of this Neon Caterpillar D7 on Giles & Ransome's Philadelphia office move as the operator thrusts his arm forward. At least they look as if they do, thanks to a three-way lighting cycle.

FOR OVER 50 YEARS

CONTINUOUS DEPENDABILITY



ELECTRIC GENERATING SETS

HILL DIESEL

5 to 30 Killowatts

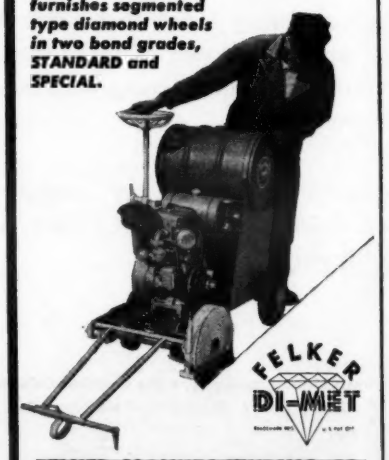
HILL DIESEL ENGINE CORP.
LANSING, MICHIGAN

new low cost CONCRETE CUTTER

Felker DI-MET Standard Model

12" DIAMOND WHEEL (MAX. SIZE)
CUTS TO 3½" DEPTH
DOUBLE ENDED SPINDLE for right or left-hand operation.
EASY MANEUVERABILITY! Balanced. Turns, pivots in own length.
ONE MAN OPERATION.
TOWS TO AND FROM JOB! No loading, no hauling.
PNEUMATIC TIRES—Noiseless! Travels anywhere at usual road speed!
TWO COOLANT PROVISIONS. Integral tank or hose connection.
POWERFUL 7½ h.p. gasoline engine.
Available from your DI-MET dealer. Get all the facts! Write for free literature!

For utmost wheel life in all concrete cutting applications DI-MET furnishes segmented type diamond wheels in two bond grades, STANDARD and SPECIAL.



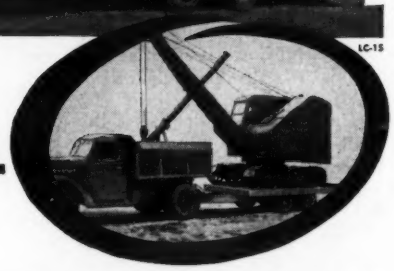
FELKER MANUFACTURING CO.
Torrance, California

World's Largest Manufacturer of Diamond Abrasive Cut-Off Wheels and Equipment

New HEAVY-DUTY Tilting Trailer cuts hauling costs!

Capacities: 13, 16 & 20-tons

Easily loaded or unloaded in 5 min. by 1 man



NOW, with this new La Crosse tandem axle tilting trailer, you can use YOUR OWN DUMP-TRUCK to speed job-to-job moves of ¾-yd. shovels and other powered equipment. It's quick, easy, economical! No skids or blocking required . . . no expensive one-purpose trucks! One man simply hooks trailer to dump truck . . . unlocks safety catch to tilt trailer platform . . . drives equipment onto deck . . . and he's ready to go. Double-acting hydraulic cylinders level platform for traveling. Special La Crosse tandem axles assure smooth riding over any road, while husky constant rise S cam brakes give you quick, safe stops with minimum wear on linings. Write for complete details on this new money-saving trailer.

Check Today!

LA CROSSE TRAILER CORPORATION, La Crosse, Wis.

Send full details on La Crosse ☐ Tilt Trailers ☐ Standard Low Beds

We may be interested in a.....ton trailer about.....
for hauling.....
(Type of load)

Name.....
Occupation or business.....
Address.....
City.....State.....

LaCROSSE
America's Favorite LOW BED TRAILER

Distributor Doings

(*Continued from preceding page*)

Stoody Distributor List

There have been several changes and additions in the distributor list of Stoody Co., Whittier, Calif., manufacturer of welding equipment.

In California, Agricultural Supply Co. of Escondido covers San Diego County; Hust Bros., Inc., of Marysville covers Butte, Sutter, Yolo, Yuba, Nevada, and Placer Counties; Moore's Welding Supply Co. of Sacramento covers the north-central part of the state; G. S. Parsons Co. of San Diego has San Diego County; California Welding Supply Co. of Stockton handles Contra Costa, Alameda, San Joaquin, Stanislaus, Eldorado, Amador, Calaveras, Tuoloumne, and Alpine Counties; and Hickinbotham Bros., Ltd., of Stockton works from Highway 120 north to Rio Vista and Plymouth.

The west-central portion of Florida is served by General Auto Supply Co., Inc., of Tampa. Illinois and portions of Wisconsin, Iowa, Indiana, Kentucky, and Missouri are served by J. C. Menzies & Co. of Chicago. Welders Equipment Co. of Lake Charles, La., and Welders Supply Co., of New Iberia, La., have southwest Louisiana and eastern Texas.

Southeast Maine is assigned to J. J. Boulter & Son of Bangor; Aroostook County to Northeastern Supply Co. of Caribou; western Maine and a portion of New Hampshire to Lewiston Welding Co. of Lewiston; and southern Maine and southeast New Hampshire to Portland Welding Supply of South Portland.

Harrington Welding Co. of Gering, Nebr., covers much of Wyoming, southwest South Dakota, and western Nebraska. Bowen Welding Supply of Clovis, N. Mex., covers 11 counties in the northeast section of New Mexico and the Texas counties of Parmer, Bailey, Cochran, and Hockley.

Eugene Welders Supply Co. of Eugene, Oreg., has been named for portions of Coos, Douglas, Lane, Benton, and Linn Counties in that state, and Industrial Air Products Co. of Portland, Oreg., for Oregon, southern Washington, part of Idaho, and the northern tip of California. Welding Materials, Inc., of Lemoyne, Pa., serves the eastern part of that state and central New York.

Texas distributors are Taylor-Simpkins, Inc., El Paso, for southern New Mexico and southwestern Texas; Gulf Welding Supply Co., Harlingen, for the tip of Texas south of Corpus Christi; and C. F. Myrow Supply Co., Houston, for south-central Texas and the cities of Waco, San Antonio, Laredo, Corpus Christi, and Galveston.

Western Oxygen, Inc., Harbor Island in Seattle, Wash., covers western Washington and Alaska.

Four Outlets for Nelson

The Nelson Stud Welding Division, Morton Gregory Corp., Lorain, Ohio, has four new outlets. United States Steel Supply Co. distributes Rivweld studs to purchasers of corrugated steel and aluminum roofing and siding. Southern States Iron & Roofing Co. is handling these products in 13 southern states. The Philip Carey Mfg. Co., Cincinnati, and the Asbestone Corp., New Orleans, are distributing Nelson studwelding fasteners developed for corrugated and flat asbestos products. The Armstrong Cork Co., Lancaster, Pa., handles insulation pins and speed clips for insulating materials employed on boiler and powerhouse equipment.

REMEMBER
Sell or Buy Used Equipment.
Acquire experienced help.
Send your copy to
The Trading Post
Contractors & Engineers Monthly
470 Fourth Ave., New York 16, N. Y.

Water-line pipe goes in near Pittsburgh. Frank Kukurin & Sons of Wilmerding is the contractor. Lima Paymaster shovels furnished by Highway Equipment Co., Pittsburgh and Harrisburg distributor, do the work.

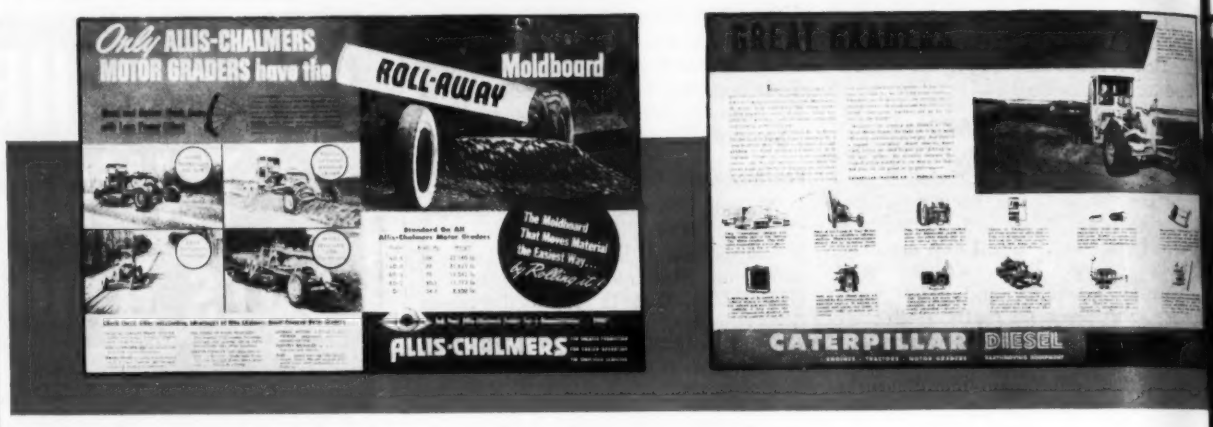
New Manufacturer's Representative

Carlos A. Dominguez, President, and Bruce L. Rackliffe, Vice President, have established the Dorac Corp., 62 LaSalle Road, West Hartford, Conn. Dorac will represent manufacturers of contractors and transportation equipment in New England and act as a purchasing agent for its subsidiary company in Caracas, Venezuela, and for selected companies in Latin America.

Mr. Dominguez was formerly chief electrical engineer for a large Latin-American cement-producing firm. Mr. Rackliffe, a sales engineer, came to Dorac from Tyson Bearing Corp.

For Cleco in Wilkes-Barre Area

Ensminger Co. of Wilkes-Barre, Pa., has been named a distributor by the Cleco Division of the Reed Roller Bit Co., Houston. It will handle the full line of Cleco pneumatic tools and will stock parts and accessories.


Only ALLIS-CHALMERS MOTOR GRADERS have the ROLL-AWAY Moldboard
The Moldboard That Moves Material the Easiest Way... by Rolling it!
ALLIS-CHALMERS
CATERPILLAR DIESEL

Highway Graders*

Building and maintaining our modern highway network would be impossible without dependable graders. Contractors, state and county engineers, and other highway officials all need and buy graders for their highway paving and maintenance operations.

And to sell these buying groups, the overwhelming majority of grader manufacturers choose **CONTRACTORS AND ENGINEERS MONTHLY** for their sales message. Like other equipment manufacturers they know that **C&E Monthly** has the circulation to reach the highway reader, and a balanced editorial formula to hold his interest. Furthermore, they know its advertising columns comprise the most complete purchasing guide available in any monthly publication.

Whatever you have to sell to the highway industry — or to any segment of the entire heavy construction field — **CONTRACTORS AND ENGINEERS MONTHLY** should be No. 1 on your hit parade.

* J. D. Adams Manufacturing Co. • Allis-Chalmers Manufacturing Co. • The American-Coleman Co. • Austin-Western Co. • Caterpillar Tractor Co. • Central Construction Co. • Galion Iron Wks. & Mfg. Co. • Gledhill Road Machinery Co. • Huber Manufacturing Co. • Northfield Iron Co. • W. A. Riddell Corp. • Ulrich Products Corp.

the NEWSpaper of highway and heavy construction

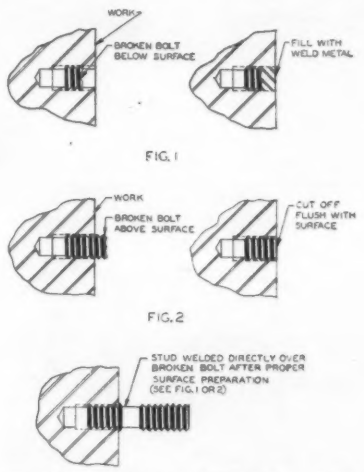
Wire-Fence Splicer

A fence splicer designed for quick tying and splicing of wires to end posts has been developed by Viola Sales & Engineering Co., Viola, Ill. The Jiffy splicer, which is made from solid case-hardened steel, fits No. 7 or a lighter-gage wire. The handles will operate freely between 2½-inch mesh openings. In operation, the slot of the splicer fits over a stretched strand of wire with a claw-end engaging the free end of the wire. The knurled insert locks the tool on the wire and a short handle provides leverage for bending the wire around the stretched strand.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 47.

A Maintenance Tip

Replacing broken bolts can be a maintenance man's bugaboo since it means the time-consuming business of removing the broken portion, retapping the hole, and inserting a new bolt. According to the Nelson Stud Welding Division, Lorain, Ohio, bolt-replacement time may be cut by using a Nelson stud-welding gun. If the bolt breaks above the surface, it is cut off flush. The stud is then end-welded directly over the embedded portion of the original bolt. When the bolt breaks below the surface, the hole is filled with weld metal and the stud is end-welded in position.


WORK
BROKEN BOLT BELOW SURFACE
FILL WITH WELD METAL
FIG. 1
WORK
BROKEN BOLT ABOVE SURFACE
CUT OFF FLUSH WITH SURFACE
FIG. 2
STUD WELDED DIRECTLY OVER BROKEN BOLT AFTER PROPER SURFACE PREPARATION (SEE FIG. 1 OR 2)

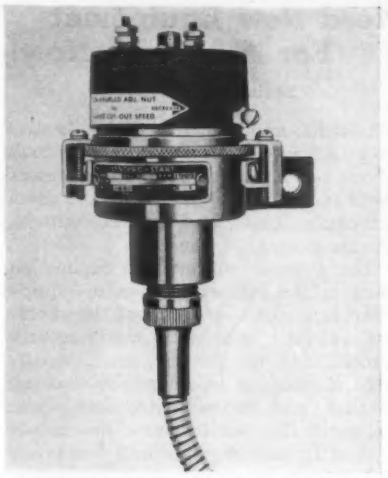
Here's a way to replace broken bolts with end-welded studs.

Cummins Purchases Wappat

Cummins Portable Tools Co. of Chicago has purchased the assets of Fred W. Wappat, Inc., Mayville, N. Y., manufacturer of portable electric hand saws. Cummins will operate the property as the Fred W. Wappat Division.

Marion Sales Appointee

The Marion Power Shovel Co. has appointed Charles K. Essex a sales representative for northeastern Ohio, three northern Pennsylvania counties, and part of northwestern New York State. His headquarters are in the company's general offices at Marion, Ohio.



Synchro-Start Products, Inc., has developed this new overspeed governor for safety shutdown of internal-combustion engines and machinery.

Overspeed Governor

A new overspeed governor for safety shutdown of internal-combustion engines and machinery has been developed by Synchro-Start Products, Inc., 1046 W. Fullerton Ave., Chicago 14, Ill. It is adjustable to decrease or increase the shutdown speed while running. The Model GFA comes equipped with automatic reset and the GFM with manual reset.

New features of this governor are sealed steel ball bearings with an extra lubricant reservoir sufficient for life run, and a standard takeoff for heavy-duty tachometer drive for use with a flexible shaft. This new governor is 5 inches in height, of full-metal construction, and is equipped with a mounting bracket. Models GFA and GFM augment the line of GP and GK overspeed governors for standard SAE drives which have been in production many years.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 110.

New Bin Vibrators

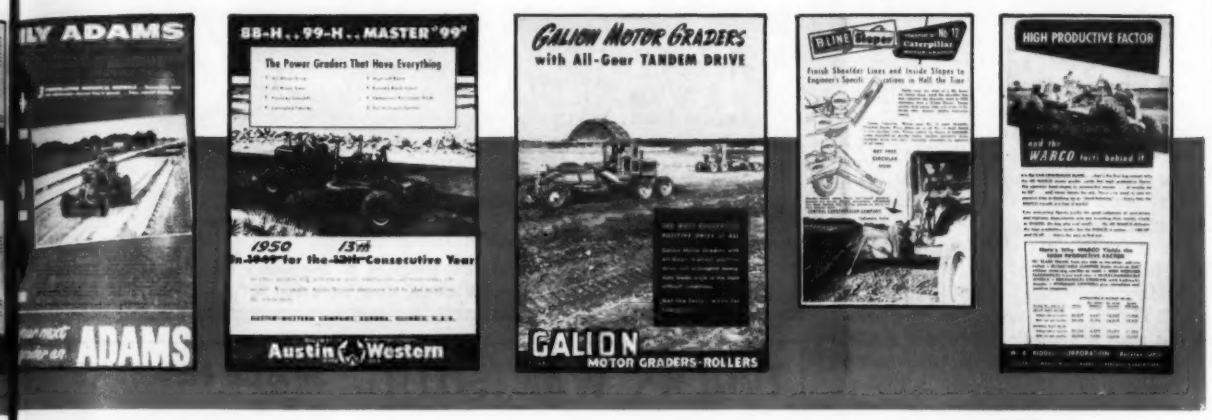
A new type of air vibrator has been announced by the Cleveland Vibrator Co., 2850 Clinton Ave., Cleveland, Ohio. It is designed for freeing stubborn materials that plug up or arch in chutes, hoppers, bins, screens, or storage tanks. Its principal application in the construction field is for gravity-feed supply of cement, though it may also be used for work with sand, gravel, and cinders.

Feature of the new unit is a simplified design which is said to reduce wear, cut maintenance cost, and offer easier operation. The number of major parts has been reduced to five: mounting base plate, housing, spring, piston, and head. The Type F vibrators are available in six sizes for use on bins containing one to several hundred tons of material.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 50.

Autocar Office Moves

The Autocar Co., Ardmore, Pa., has moved its Connecticut district offices from its New Haven to its Hartford branch at 125 Airport Road.



Four Major Facts about C&E Monthly

1. It carries more editorial material than any other monthly publication in the field.
2. It also carries a higher proportion of editorial to advertising content.
3. C&E Monthly carries more advertisers than any other monthly, and,
4. More *exclusive* advertisers.

1950 Thirty Years of Service to Construction 1950
Contractors and Engineers Monthly
Vol. 47, No. 3
$3 a Year, 50 Cents a Copy
Covering the Field
SEWAGE PLANT EXCAVATION
A STEEL TRANSIT SHED
THE LONGEST PAVING JOB

Contractors and Engineers Monthly
470 Fourth Ave., New York 16, N. Y.

Need New Equipment For '51? Order Now!

(*Continued from page 3*)

2 months, and asphalt heating kettles at 2 to 3 weeks. Concrete mixers took about 1 to 2 months, concrete vibrators from immediate to 1 month—the same for chutes, carts, and concrete cutters. Pumps average 5 weeks.

There were not enough replies on each of the following types of equipment to strike averages, but the shortest delivery date any manufacturer quoted, and the longest, are interesting. Replies on salamanders, thawing torches, and heaters cited immediate delivery. Gas and electric generators ranged from immediate to 6 weeks; so did saws and power tools generally. Plows and material spreaders ranged from immediate to 8 weeks.

Graders and maintainers could be supplied in from 1 week to 6 months, depending on the manufacturer; dozers and rippers in from 2 to 3 weeks; conveyors in from 2 to 10 weeks; and crushing equipment in from 2 to 12 weeks. Compressors took 2 weeks to 5 months; scaffolding 3 to 6 weeks; batch plants 4 to 8 weeks; trenchers 1 to 3 months; wheelbarrows 2 to 6 months ("steel sheet is short"); wire rope 3 months; and asphalt finishers 5 months.

As mentioned before, three-fourths of the replies pictured the delivery situation as worse now than a year ago. Of the one-fourth which reported deliveries about the same as last year, most of them were from manufacturers of asphalt kettles and asphalt plants, batch plants, concrete vibrators and cutters, crushing equipment, dozers, plows, pumps, rippers, saws, and material spreaders.

Production Outlook

The consensus on production is that it has increased since the outbreak of war in Korea and will continue to increase in the first half of 1951. Sixty-one per cent of the replies noted a production step-up since June (those who commented on it usually said it was "slight"), 26 per cent said production is the same, 10 per cent said it has decreased. Those who commented on the decrease said it was slight and attributed it to lack of steel. (Only one reply reported that production had ceased. The remaining percentage did not reply.)

Present production will increase during the first half of 1951, said 74 per cent of the replies. It will decrease, said 14 per cent. It will stay about the same, said 10 per cent. (The remaining percentage did not reply.) Those who commented on the predicted increase called it "moderate" and added "if materials are available". Those who commented on the predicted decrease again spoke of the steel shortage.

Manufacturers' Comments

Several manufacturers commented at length on the situation, present and future, when they returned the questionnaire. Some, indeed, sent letters instead of filling in the questionnaire; they felt they could not give anything but "wide guesses" and they preferred to qualify what they had to say. One wrote, "We almost might say that an answer to this questionnaire would mean another questionnaire to be sent to the Government and to our suppliers, as they certainly are in control of our future production and sales plans."

In general, they spoke of depleted inventories and indefinite scheduling of items from their suppliers . . . of increased production likely for defense purposes, with possible curtailment of production for the construction industry . . . of uncertainty about Government action on controls . . . of greater business volume coupled with material shortages and higher prices.

Steel was mentioned most frequently as "short" or "tight". One manufacturer said the demand for steel was up 500 per cent over October 1, 1949. One said that, in his view, construction will be curtailed by limited cement and his manufacture will be curtailed by limited steel. One said he would be in a "jam" by the middle of this month "unless steel clears up". The situation on tires, bearings, and diesel engines is getting critical, said one, and it "will be worse in 1951". Several spoke of a steady rise in orders since last March, with a sharper rise after Korea. One forecast a trend toward spending more money to repair present equipment, now that prices are high and shipments are slowing down. One spoke of better deliveries from December to February, with another slowdown then to deliveries extending to 6 months.

Moral

If this is the delivery picture, what about the purchasing picture? Another survey C&E MONTHLY has just concluded, among blacktop-paving contractors, shows in what season they purchase their equipment. Spring, it shows, is the most popular purchasing time, summer the second most popular, winter the third, and "as needed" or "after jobs are awarded" the fourth.

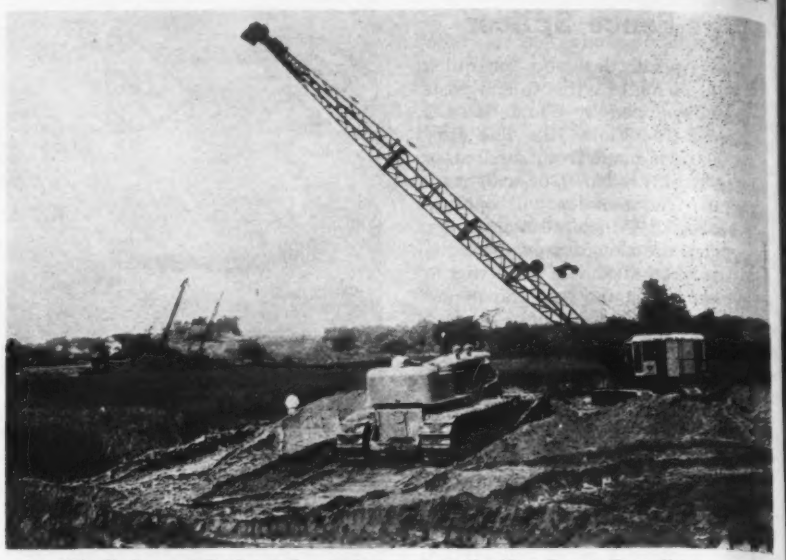
Now with deliveries at least 4 to 8 weeks slower this year than last, we suggest to contractors and agencies whose purchasing habits follow this line that several changes are in order this year and next.

Those who buy "as needed" will probably be out of luck next year. Ditto for those who buy in the summer. Those who order in the early spring *may* get what they order in time for summer jobs. But early winter is the really smart time to buy in 1950-51. Or better yet, right now.

As one manufacturer volunteered, "Steel and rubber are more difficult to get, and business is greatly on the increase. Therefore we suggest that your readers place orders now for spring delivery."

News From Red Jacket

John Vonderheide, former General Sales Manager of A. D. Cook, Inc., is working on a new sales program for the Red Jacket Mfg. Co., Davenport, Iowa. He will handle national industrial sales promotion of Red Jacket-Reda Submerga-Pumps.



An Allis-Chalmers HD-19 crawler pushes work on the New Jersey Turnpike by spreading a sand blanket over the marshy approaches to the north bank of the Raritan River near New Brunswick. A Lorain dragline cast top silt away from the approach area. Contractors on the job are Angelo and George Villa, of the Villa Construction Co.

TRADING POST

CLASSIFIED ADVERTISING

An advertising inch in the Trading Post is measured ⅞-inch vertically on one column. Space reservations close in the New York office on the 10th of the month, preceding publication. Send your classified copy to:

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470 Fourth Avenue, New York 16, N.Y.

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2800 pcs. 62-20 ft. Carn. MP101-Kentucky
100 pcs. 60 ft. Both. AP3-Buffalo
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Other lengths & sections at various locations
All sizes Vulcan & McKiernan Pile Hammers & Extractors for Rent and Sale—Shop Rebuilt
Regardless of location of your job, wire or write
MISSISSIPPI VALLEY EQUIPMENT CO.
503 Locust St., St. Louis, Mo.
"WE BUY STEEL PILING FOR CASH"

FOR SALE
STEEL FORMS
in very good condition
5,000 SQUARE FEET
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DITCHER FOR SALE

Buckeye Model 408. Used as demonstrator only. Approximately 200 hours.

When new priced.....$11,500
SPECIAL SALE PRICE.....$ 8,500

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SPECIALIZED REBUILDING
of surveying and engineering instruments
All makes and models expertly repaired in modern shop. All work guaranteed.
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SPACE HEATERS
War Surplus Bargain
New—Ready to Use!
40,000 BTU capacity

Burning gasoline, kerosene or diesel fuel

Electric blower—12 V. DC or 110 V. AC using small transformer which we furnish

Portable, Quick, Clean Heat

Ideal for curing room, concrete plants, work under construction, emergency heat, or auxiliary heaters.

$95.00 each

Clapp, Riley and Hall Co.
Phone: FRanklin 2-4028
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STOP *that* WATER
with FORMULA No. 640
A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs applies quickly—no mixing—no cleanup—no furring—no membrane. Write for technical data—free sample.
HAYNES PRODUCTS CO., OMAHA 3, NEBR.

GOOD USED EQUIPMENT

OSGOOD—Model 200, ½ yd. Backhoe

CLETRAC—Model DD Diesel Bulldozer

CATERPILLAR — Model D4 Bulldozer and Loader

CATERPILLAR — Model D2 Traxcavator

ALLIS-CHALMERS—Model K Bulldozer

LITTLEFORD—2½ ton Roller

C.H. & E.—3 ton Roller

R. B. WING & SON CORP.
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IS RE-ROPING ONE OF YOUR "Headaches"?

If so—look to Electroline Wire Rope Fittings! These permanent wire rope fittings prolong the life of wire rope by damping vibration stresses and overcoming rope fatigue at entrance to fittings—Electroline Fittings Definitely Minimize Re-Roping!

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1—Caterpillar Model D-6 tractor with LaPlant-Choate bulldozer and Hyster winch.

3 cu. yd. 2 wheel Gar Wood hydraulic scraper. Like new.

1—Slightly used 1949 Mack Model E.H.T., demonstrator. Very good discount. Equipped with Tulsa winch, less fifth wheel.

1—Slightly used FWD Model HG w/ Heil dump body, $5,000.00.

New Winch-Lift trailers — 12 and 20 cu. yd. capacity.

1—Novo traffic line marker.

1 Worthington 210 cfm portable compressor.

1—Allis-Chalmers WK tractor w/ Baker bulldozer.

1—Gardner-Denver Model 105 portable compressor.

1—Buckeye No. 1 Ditcher.

✦

ILLINOIS ROAD EQUIPMENT CO.

1310 E. Jefferson St.

Springfield, Ill.

Phone 2-7709

Import of European Building-Machines

Have your purchase orders on all European building-machines (excavators, loading-cranes, centrifugal-pumps, roadrollers, winches, steel piling, diesel pile-driving cars, etc.) executed by experts.

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De Zeeuw, Heemstede (Holland)
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LORAIN 75 Heavy-Duty shovel with G.M. Diesel. Good working order. F.O.B. Phila. $8000.00

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USED EQUIPMENT

1 Pioneer 4x12 triple deck vibrator
1 Lippmann 42x24 roller bearing roll crusher
1 Lippmann 18x24 hammermill

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FOR SALE

1—Thoroughly reconditioned TD24 Crawler with new P29 double-drum Bucyrus-Erie Winch.

FLOYD O. MAPES
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Phone: 6669

FOR SALE

1—Rex paver 27E $3750
1—Koehring 28S Mixer, gas power $1350
1—10-ton American Steel stiff leg derrick 110' boom $1800
1—25-h.p. gas hoist 2-drum ..... $ 750
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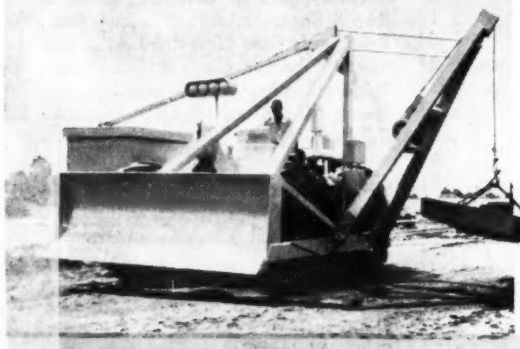

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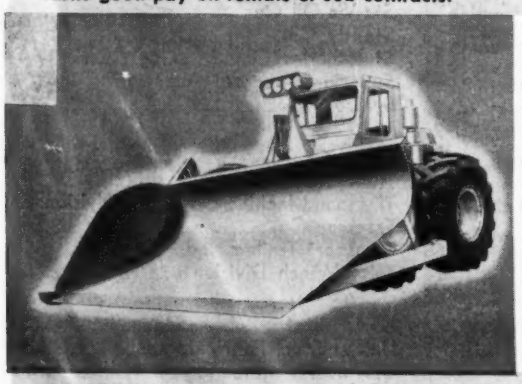
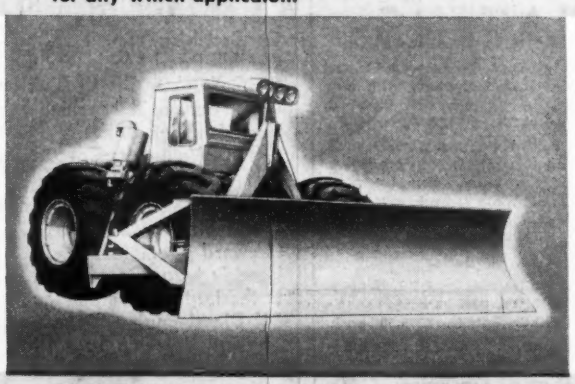
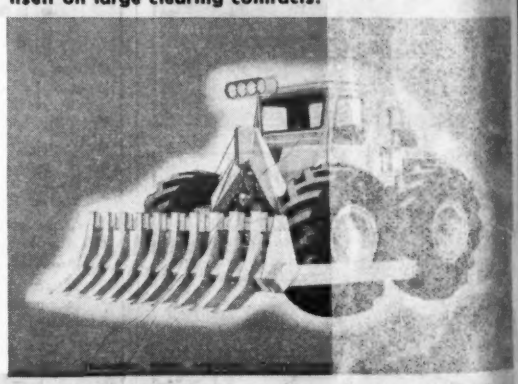


V-TYPE SNOW PLOW . . . has 12′3″ clearing width . . . flows snow 6½′ high off ends of plowshare blade. Vertical divider plate cuts frozen drifts, eliminates plowing snow back onto road when widening. Has adjustable runner shoe. Electrically-operated Snow Wing also available. Assures steady earnings during winter months.



ANGLEDOZER . . . for extensive sidehill work, regular Bulldozer can be interchanged with Angledozer blade and side arms. Husky 13′ x 41½″ blade angles 20° right or left . . . optional electric motor tilts either blade corner 10″ up or down for digging with point. Uses same A-frame and fast-acting electric PCU as Bulldozer.



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